Intergovernmental Agreement for Remedial Investigation and Source Control Measures

DEQ No. LQVC-NWR-03-10

Outfall Basin 22 Dry-Weather Flow, Inline Solids, and Sediment Investigation

Technical Memorandum No. OF 22-2 City of Portland Outfall Project ECSI No. 2425

July 2015

PREPARED BY



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TECHNICAL MEMORANDUM No. OF22-2

Outfall Basin 22 Dry-Weather Flow, Inline Solids, and Sediment Investigation

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DATE: July 15, 2015

SUBJECT: Portland Harbor Source Investigations

Introduction

This technical memorandum presents the results of the City of Portland source investigation, conducted between May 27th and June 3rd, 2015, in Outfall Basin 22. The City's BES Portland Harbor program conducted this investigation in response to recurring reports of oil sheen in the vicinity of Outfall 22 (OF-22) and recent discussions with the USCG, DEQ, BES Pollution Prevention staff, and representatives from industrial sites in the basin.

Basin 22 is located on the west side of the Willamette River in the Willbridge area, which largely consists of bulk fuel terminals that have been in operation since the early 1900s. The basin includes drainage from Forest Park, a small residential and commercial area, Highway 30, and an industrial area between Highway 30 and the river. The majority of the developed area consists of industrial sites that are evaluating contaminant pathways to the river under DEQ Cleanup Program oversight to determine whether additional source controls are needed. Due to the nature and extent of site-related contamination, Cleanup Program work has included evaluation of stormwater and preferential groundwater discharges into and along the Basin 22 conveyance system. Remedial investigation of the bulk fuel terminal area dates to the late 1970s, and has entailed site-specific work under individual agreements with DEQ and collaborative work on the groundwater concerns by three of the terminals under a Consent Order with DEQ for the Willbridge Bulk Fuel Area. In 2013 under an Intergovernmental Agreement (IGA) with DEQ for investigation of sources to City outfalls in Portland Harbor (DEQ, 2003), the City concluded that all major contaminant sources in the basin had been identified and would be controlled by DEQ Cleanup and Water Quality programs (BES, 2013).

Frequent observations of petroleum sheen at OF-22 indicate that current controls at known sources are not adequate and/or that there are unknown sources present. The objective of the investigation described in this memorandum was to identify specific source areas and pathways to the Basin 22 conveyance system that warrant further investigation, control, and/or enforcement under City, state, or federal authority. Other investigations contributing to this specific City investigation include ongoing work by the USCG, the Willbridge-area sites (Sites), and the City to identify an intermittent source of oil sheen to OF-22.

Investigation results indicate that preferential groundwater pathways to the Basin 22 conveyance system are present and that contaminants present in dry-weather flow entering the municipal system are a potential source of sheen observed at the outfall and warrant control. System investigation also identified an area of the system where inline solids indicate that a historical release occurred. Source investigation activities, findings, and recommendations are described in detail below.

Background

Conveyance System Configuration and Drainage Basin

OF-22 discharges to the west side of the Willamette River at approximately River Mile 7.8 (see Figure 1) in an area known as Willbridge Cove, and drains approximately 95 acres. Basin 22 includes a portion of Highway 30 (i.e., major transportation land use). Land use in the basin on the west side of Highway 30 (NW St. Helens Road) is predominantly open space (Forest Park), with a small mixed commercial and residential area. Land use on the east side of NW St. Helens Rd. is heavy industrial.

The U.S. Environmental Protection Agency (EPA) has designated the inriver area in the vicinity of OF-22 as an Area of Potential Concern (AOPC 16) based on elevated concentrations of metals, polycyclic aromatic hydrocarbons (PAHs), and other contaminants in river sediment (EPA, 2010). In addition to OF-22, 11 non-City outfalls also discharge to AOPC 16 in the area of Willbridge Cove, and there are three docks within the cove. Due to a history of releases from Sites to the outfall, the Sites installed and maintain a containment boom around OF-22 as part of ongoing sheen response activities (ARCADIS, 2009a) and constructed a cutoff collar and liner in the portion of the conveyance system between NW Front and the outfall to control preferential migration of contaminated groundwater into and along this segment of Basin 22.

The conveyance system consists of two main branches (i.e., NW Doane Avenue and NW Front Avenue) that combine at a manhole east of NW Front Avenue and discharge to OF-22 via a 60-inch-diameter pipe. Surface drainage from Forest Park passes through a water quality swale before joining with stormwater flow from the developed area west of Highway 30 and drainage from the roadway. This drainage then flows into the NW Doane Avenue branch of the system, which serves the adjacent bulk oil terminals (i.e., Chevron Willbridge Distribution Terminal and Phillips 66 Company). The NW Front Avenue branch extends south from NW Doane Avenue and serves the former Chevron Asphalt facility on the west side of NW Front and the McCall Oil/Brenntag Pacific facilities on the east side of NW Front.

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Potential Petroleum Source Areas

Known potential source areas include six DEQ Cleanup Program sites in Basin 22, as listed in DEQ's Environmental Cleanup Site Information (ECSI) database. Four of these sites are bulk fuel and/or chemical storage facilities (Chevron-Willbridge Distribution Terminal, Chevron USA Asphalt, Unocal – Willbridge Terminal/Phillips 66, and McCall Oil). Small portions of the remaining two sites (Oregon Department of Transportation – ODOT and Burlington Northern Santa Fe Willbridge Yard) are included in the basin. General locations of these sites are shown on Figure 1, spatial extent of each site is shown on Figure 2, and known piped connections from each site to the Basin 22 conveyance system are shown on Figure 3.

Two of the six ECSI sites (Chevron USA Asphalt – ECSI #1281 and McCall Oil – ECSI #134) completed a Source Control Evaluation (SCE) under DEQ oversight, and received Source Control Decisions from DEQ (DEQ, 2010 and 2014). These decisions conclude that contamination at these sites has been characterized and controlled to the extent feasible and that these sites are not significant ongoing sources of contaminants to the Willamette River. SCEs are underway at the four remaining ECSI sites to identify all potentially complete pathways to the river, to determine whether site contaminants are migrating offsite via those pathways, and to implement source controls where needed.

Industrial sites that are covered by National Pollutant Discharge Elimination System (NPDES) stormwater regulations also were considered as potential sources of sheen to the City conveyance system, because permit coverage is based on the nature of the industrial operation and the potential for stormwater to be exposed to pollutants associated with industrial operations. Current industrial stormwater permittees within the basin are shown on Figure 1.

The area west of NW St. Helens Rd. is not likely to contain significant sheen sources. The majority of the drainage in this area is from Forest Park, and the developed area is a mix of residential and small commercial properties. City review of stormwater data collected by the Sites (ARCADIS, 2012a) to represent basin stormwater coming into the system upstream of terminal connections did not indicate that significant contaminant sources were present in this portion of the basin (BES, 2012a).

Previous Investigations

- The City completed an inline solids source investigation in Basin 22 in 2006 under an ongoing IGA with DEQ (DEQ, 2003), to determine whether there were major contaminant sources in the basin (BES, 2008). Results indicated that metals (copper and zinc), PAHs, and bis(2-ethylhexyl)phthalate sources were present, but that exceedances of DEQ/EPA Joint Source Control Strategy (JSCS) screening levels were relatively low (DEQ/EPA, 2005).
- In 2007-2008, the Lower Willamette Group collected stormwater and sediment trap data in Basin 22 at a point representing all piped discharges to the basin (Anchor and Integral, 2008), and the City evaluated these data to determine if the results changed the City's conclusions about the need for additional source tracing. Based on the results of these data and site investigation results, the City concluded that sources had been identified, that all identified sources were in an appropriate program for subsequent Site investigation and control, and that further City source tracing in Basin 22 was not needed (BES, 2010).

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• In 2010-2011, the Chevron Willbridge and Unocal-Willbridge Terminal (now Phillips 66) sites jointly collected stormwater upgradient and downgradient of the Terminal to meet DEQ Cleanup Program requirements (ARCADIS, 2012a). Results of those evaluations are still under DEQ review.

Recent Sheen Report Response

On April 22, 2015, BES representatives from the Environmental Compliance and Portland Harbor programs met with USCG, DEQ, and Site representatives to discuss the recent history of sheen observations at OF-22. Sites monitor the outfall and surrounding area and report sheens observed at OF-22 to DEQ and the City under the *Outfall Inspection and Sheen Response Plan* (ARCADIS, 2012b) approved by DEQ. The City was not involved in the development or approval of the plan. When sheens are observed, Site representatives investigate possible Site-related source areas. The BES Spill Protection and Citizen Response (SPCR) program also conducts investigations when it receives reports of sheens that may be related to discharges from OF-22. Analytical data have been collected by the USCG, the City SPCR Program, and Sites as part of sheen response and are managed by those respective entities.

As an outcome of the April meeting, BES agreed to coordinate with the USCG on a targeted comprehensive investigation of the Basin 22 system in an effort to identify specific sheen sources.

Sheen Source Investigation

Investigation Overview

As part of the Environmental Compliance sheen response effort, the City conducted video surveys of the NW Doane Avenue branch, the NW Front Avenue branch, and the main line between NW Front Avenue and the outfall in April and May 2015. The purpose of the video surveys was to identify specific segments of the system where further investigation was warranted (e.g., suspicious staining or discharges, inline solids accumulation, etc.). Based on a review of the video surveys, the City developed a sampling plan (see Attachment A) to describe forthcoming sheen source investigation and response plans. The investigation activities summarized in this technical memorandum represent a comprehensive three-day effort to look at a variety of potential sources and pathways to the Basin 22 system. Work conducted for this portion of the sheen investigation included: sampling and analysis of 1) sediments immediately adjacent to the outfall pipe; 2) inline solids; 3) dry-weather flow; and 4) wipes of stained areas within the conveyance system. The City analyzed all samples for total petroleum hydrocarbons (TPH) via the NWTPH-HCID method, with quantification of detected petroleum constituents if sample volume was sufficient. In addition, field crews submitted samples of dry-weather flow for PAH analysis via method SM8270-SIM and collected field readings for conductivity.

Field Activities

Sampling Locations and Procedures

BES field crews investigated the outfall and each manhole along the Doane and Front Avenue branches to identify sampling locations for sediment, inline solids, dry-weather flow, and wipes.

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Actual locations were selected based on solids and flow availability, evidence of suspicious stains, and knowledge of drainage areas served by connecting laterals. The City conducted the sampling activities consistent with the City's *Amended Programmatic Quality Assurance Project Plan* (BES, 2007a) and *Amended Programmatic Sampling and Analysis Plan* (BES, 2007b) for collection of water and solids samples for the City of Portland Outfalls Project. At some locations, the USCG requested BES field crews to collect split samples or separate samples (e.g., netted sheen samples and/or wipe samples) for analysis by the USCG. This report does not include the results of the USCG analyses. Sampling locations are summarized by sampling matrix in Table 1 and are shown on Figure 4.

Sample collection took place over three days: May 27th, May 28th, and June 3rd, 2015. Field crews began at the outfall and then worked their way up-the-pipe along each main branch from downstream to upstream. Weather conditions on May 27th and May 28th were dry, with more than two weeks of antecedent dry period (i.e., rainfall < 0.10 inches over each 24-hour period). Shower activity on June 1st and 2nd resulted in 0.18 inches and 0.11 inches of rain being recorded at the BES Water Pollution Control Laboratory (WPCL) rain gage on those days. Recordable rainfall did not occur during sample collection activities on June 3rd. Due to these conditions, flow observations made on June 3rd could reflect both stormwater and preferential groundwater discharges from adjacent upland areas.

A total of one outfall sediment sample, fourteen inline solids samples, fourteen dry-weather flow samples, and eleven wipe samples were collected to investigate possible sheen sources to Basin 22. Field crews also collected an equipment blank sample for quality assurance. Photographs of the sampling locations are provided in Attachment B. Field notes taken during sampling activities are provided in Attachment C. Additional details regarding sample collection and analysis are provided below.

Outfall Sediment Sample

Inspection of OF-22 indicated that the river level was below the elevation of the outfall pipe and that pockets of sandy sediment and iron bacteria were present between the outfall and the river edge (see Photo 2). Chevron maintains multiple booms around the area to which the outfall discharges, and a sheen was evident in the boomed area at the time of sample collection (see Photos 1 and 3). The field crew collected a surface sediment composite sample from the area adjacent to the outfall by collecting three subsamples of approximately equal volume, from three discrete location, homogenizing them into one sample, and filling the sample jars. BES provided a split sample to the USCG.

Conveyance System Samples

Outfall Main

Outfall 22

• Dry-weather flow sample from the outfall (dry-weather flow from the outfall is visible in Photo 2).

Manhole AAM077

This is the junction of the Doane and Front Avenue branches, and the beginning of the lined section of the system (i.e., groundwater not expected to infiltrate directly to the system between this location and the outfall).

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• Three dry-weather flow samples: outgoing line, incoming line from Doane, incoming line from Front (see Photos 4-6).

Doane Avenue Branch

Manhole AAM080

- Inline solids from main line upstream of manhole (see Photo 7).
- Dry-weather flow from manhole.

Manhole AAM075

Two site laterals (Chevron #1 and Phillips #1) connect at this location (see Photos 9-10).

- Two inline solids samples: upstream of manhole in main line and on shelf in manhole (see Photos 11-12).
- Two dry-weather flow samples: main line downstream of manhole and from Chevron #1 lateral. Flow observed in Phillips #1 lateral but not enough volume to sample.
- Three wipe samples due to observance of stains and possible sheen: Chevron #1 lateral, Phillips #1 lateral, and shelf near bottom of manhole invert.

Manhole AAM076

- One inline solids sample from outgoing line.
- One wipe sample from small dry stain on underside of sanitary lateral crossing through manhole chamber (see Photos 13-14).

Wye APA018

This is a lateral line (Phillips #2) that enters the main line from the south between manholes AAM076 and AAM086 (see Photo 15).

- One dry-weather flow sample from water entering main from space below the Phillips #2 lateral line (i.e., preferential flow along the underside of the lateral line). Floating and suspended black droplets observed in sample (see Photo 16).
- One wipe sample from a dark stain on the upstream side of the Phillips #2 lateral connection.

Manhole APA016

Three incoming private lines enter this manhole from the Phillips 66 site and discharge to NW Doane via the APA018 wye.

- One dry-weather flow sample from manhole.
- One wipe sample from stained area within manhole chamber (see Photo 17).

Manhole AAM086

• One inline solids sample from outgoing line (see Photo 18).

Private manhole to lateral AQB059

Access point to Chevron #2 lateral that has a blind connection to the Doane Avenue main.

- One dry-weather flow sample from manhole (see Photos 19-20).
- Two wipe samples from stained areas around two inlets to private manhole.

Manhole AAP794

Point of connection for lateral line from south (Phillips #3).

- One inline solids sample from outgoing main line (see Photo 22).
- Two dry-weather flow samples: one from Phillips #3 lateral (see Photo 21) and one from incoming main line to manhole.

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Manhole ANV453

Location where two lines from Phillips 66 site converge before discharge to AAP794 (see Photos 23-24).

• Two wipe samples: one from east lateral and one from east side of manhole invert.

Manhole AAP792

Point of connection for lateral line from north (Chevron #3).

• One dry-weather flow sample from Chevron #3 (see Photo 25).

Manhole AAP791

Upstream of all bulk oil terminal connections.

- One inline solids sample upstream of manhole in main line (see Photo 26).
- One dry-weather flow sample in manhole (see Photo 27).

Front Avenue Branch

Manhole AAM078

Downstream of all connections to the Front Avenue branch.

- One inline solids sample from incoming main line (see Photo 28).
- One wipe sample from infiltration area around manhole collar (see Photo 29).

Manhole AAP799

Point of connection for McCall #3 lateral and historical connections from former Chevron Asphalt facility.

• Two inline solids samples: one from outgoing line and one from incoming inactive 15-inch lateral from the west (see Photos 30-31).

Manhole AAP796

Access point on inactive line to which former Chevron Asphalt site had two connections (now abandoned).

• One inline solids sample upstream of manhole in 8-inch lateral from the north (see Photo 32).

Manhole AAP800

Current point of connections for Chevron Asphalt site and McCall #5 lateral. Inline solids observed midway up pipe walls, only upstream of manhole.

• One inline solids sample from material caked on pipe walls, upstream of manhole (see Photo 33).

Unmapped Catch Basin on South Side of NW Front

Located on the south side of the unpaved portion of the right-of-way (i.e., in the gravel area between the curb and the Chevron Asphalt site). Orientation of discharge line suggests connection to Front Avenue branch between manholes AAP799 and AAP800.

• One inline solids sample (see Photos 37-38).

Catch Basin ANF249

Located on the south side of the unpaved portion of the right-of-way, and discharges to catch basin ANF248.

• One inline solids sample (see Photos 39-40).

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Summary of Results

Laboratory results are summarized in Tables 2 through 4 and displayed on Figures 5 through 7. Attachment D includes the laboratory reports and accompanying Laboratory Data Quality Assurance/Quality Control (QA/QC) Review memorandum for each of three sample batches.

The TPH scans detected petroleum hydrocarbons in the outfall sediment sample, three of the seven inline solids samples from the Doane Avenue branch, and all seven of the inline solids samples from the Front Avenue branch. The highest concentrations in solids were found in the Front Avenue branch in a sample collected from the walls of the main line upstream of manhole AAP800.

TPH scans of the dry-weather flow samples indicated that petroleum constituents were present at the outfall and in the Doane Avenue branch (seven of eleven samples) but are not present in dry-weather flow from the Front Avenue branch. Subsequent quantification indicated that diesel-range and lube oil-range constituents were present. Quantification of gasoline-range hydrocarbons per the TPH method was not possible in the dry-weather flow samples because separate samples were not collected in the appropriate container for this purpose. However, PAH analysis (per method SM8270-SIM) also was conducted on all dry-weather flow samples. PAHs were detected in all samples, with the highest concentration observed in the Doane Avenue branch at the Phillips #2 lateral connection.

TPH was detected in two of the eleven wipe samples – both on the Doane Avenue branch, and both affiliated with lateral connections from the Phillips 66 facility.

Data Evaluation

The investigation utilized three sample matrices (sediment and inline solids, dry-weather flow, and surface wipes) to evaluate potential sources of sheen to Outfall 22. Results indicate that petroleum sources to the Doane Avenue and Front Avenue branches are present, and sources are not likely to be present between Front Avenue and the outfall. The dry-weather flow pathway is the primary concern on the Doane Avenue branch. On the Front Avenue branch, field observations and inline solids results indicate that contaminated solids are present from an unknown source near the upper end of the branch. Results from the two branches are evaluated in more detail below.

Laboratory analysts noted difficulty in quantifying petroleum hydrocarbon components in the diesel, lube oil, and gasoline ranges (see Attachment D) due to overlaps of peaks with range patterns. Therefore, in some parts of this discussion, quantified hydrocarbon fractions have been summed into a total TPH concentration.

Doane Avenue Branch

Most inline solids samples from this branch did not have detectable levels of TPH, and total TPH concentrations were <300 milligrams per kilogram (mg/Kg) for the three samples in which hydrocarbons were detected. The ten wipe sample locations on this branch primarily were

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associated with lateral connections from the Chevron and Phillips 66 facilities. Two samples, both affiliated with lateral connections from the Phillips 66 facility, indicated the presence of diesel-range hydrocarbons.

Dry-weather flow results and observations are compelling, and indicate that this continues to be a significant pathway to the river via OF-22. Figure 8 displays concentrations of total PAHs in dry-weather flow samples collected during this investigation, plotted on the DEQ guidance curve for total PAHs in stormwater discharged from Portland Harbor heavy industrial sites. The knee of this stormwater curve is at approximately $1.0~\mu g/L$ (micrograms per liter); concentrations above the curve inflection (i.e., on the rising limb) indicate concentrations that are higher than typical concentrations in stormwater from heavy industrial sites. Although Basin 22 data do not represent stormwater flows (i.e., samples were collected during dry-weather conditions), comparison to this curve is a useful line of evidence in determining whether source controls may be warranted. As shown on the curve, concentrations in the main line to the outfall and the Doane Avenue branch are all on the rising limb of the curve. Concentrations at and around the Phillips #2 lateral (see Figure 3) plot off the chart.

Observations made by field crews in the line indicate the presence of groundwater infiltration at all six of the lateral connections from the Chevron and Phillips 66 facilities. Although infiltration was not observed in the Doane Avenue main line, staining and mineral deposits were observed at joints and seams, which may indicate that groundwater infiltrates directly to this branch under some conditions (e.g., higher groundwater elevation). The highest concentrations (total PAHs of 18 and 67 μ g/L respectively) were observed in and adjacent to the Phillips #2 lateral (see Photos 15 and 16 in Attachment B). In 2008 the Phillips 66 site implemented measures to control groundwater infiltration at this lateral, including lining manhole APA016 (see Photo 17), lining the lateral between the manhole and the junction with the Doane Avenue line, and patching the joint between the Phillips #2 lateral and the main line (i.e., at wye APA018). Field crews observed flow discharging to the Doane Avenue line both from the Phillips #2 lateral and from the outside of the lateral where it joins the Doane Avenue line. The sample collected from the outside of the Phillips #2 lateral had the highest concentration of total PAHs and observable suspended material that resembled petroleum product (see Photo 16).

Elevated total PAHs also were observed in the Chevron #1 and Chevron #2 lateral lines. Flow volume in the Phillips #1 lateral line was not sufficient to collect a sample, and total PAHs in the Chevron #3 and Phillips #3 laterals were on the flatter portion of the DEQ curve.

Table 3 also compares individual PAH concentrations to relevant screening level values (SLVs) for groundwater discharges to Portland Harbor (DEQ/EPA, 2005). SLVs were exceeded in every dry-weather flow sample except in the Chevron #3 lateral sample. The SLV exceedances were up to more than two orders-of-magnitude.

In conclusion, Doane Avenue branch dry-weather flow and inline solids data do not indicate that significant sheen sources are present upgradient of the Willbridge terminal facilities. Elevated PAH concentrations in dry-weather flow being discharged to the Doane Avenue branch from the Chevron and Phillips 66 facilities are potential sources of sheen being observed at the outfall. This pathway has been under investigation at both Sites under DEQ oversight. Investigation

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¹ Job #EP8554 constructed by Stratus Corporation on behalf of the ConocoPhillips Willbridge Terminal. August 2008.

results indicate that additional source controls are needed to address the preferential pathway to the river via the Basin 22 conveyance system.

Front Avenue Branch

In the Front Avenue branch, one dry-weather flow sample, one wipe sample, and seven inline solids samples were collected and analyzed. The dry-weather flow sample and the wipe sample were both collected at the downstream end of the branch, and neither sample indicated significant presence of petroleum hydrocarbons (see Tables 3 and 4 and Figures 6 and 7). The inline solids results indicate that a petroleum hydrocarbon source (or sources) is present in the upper end of the branch (see Table 2 and Figure 5).

Three inline solids samples were collected from the main line; petroleum hydrocarbons were detected in all three samples, at concentrations ranging from 190 mg/Kg at the manhole downstream of all connections to the branch (manhole AAM078) to 123,000 mg/Kg in a sample collected upstream of manhole AAP800. An elevated concentration (11,400 mg/Kg) was also detected in a sample collected in an inactive lateral connection to manhole AAP799, (downstream of AAP800) but comparison of chromatograms from the TPH analyses confirms that material in the lateral was likely from a similar source as the source to manhole AAP800 (i.e., observed solids were deposited into the lateral from the upstream main line, not from the lateral itself). Chevron confirmed via video surveys that all connections to the storm line between manholes AAM084 and AAP796 have been abandoned with permanent caps (ARCADIS, 2009b). Therefore, because this lateral line is inactive, any solids present in this lateral originated from degradation of the piping and invert materials and/or deposits of solids from flows to manhole AAP799 from points upstream.

At the location where the solids sample with the highest TPH concentration was collected (upstream of manhole AAP800), the solids were caked on the walls of the main line (see Photo 33, Attachment B), rather than being part of the bedload typically found in the bottom of the pipe, such as was observed at manhole AAP799 downstream of this location (see Photo 30). This unique position within the pipe indicates that these solids were likely deposited during a large discharge event. The segment of the main line immediately downstream of manhole AAP800 did not have this same pattern of oily solids on the pipe walls (see Photo 34), and the only other upstream manhole (AAP802) did not have the same solid material present at or downstream of the manhole (see Photos 35 and 36). The pattern on the pipe walls upstream of AAP800 suggests that there may have been floating petroleum product in a higher-volume discharge to the system (e.g., spill, tank release, etc.) that resulted in material adhering to the pipe walls as the flow subsided. City spill records did not indicate recent large releases from the two facilities (McCall/Brenntag and Chevron Asphalt) that discharge at and upstream of this location (see Figure 3); however, not all illicit releases are reported to the City.

The City also investigated two catch basins on the south side of NW Front Avenue, in a gravel portion of the right-of-way between manholes AAP799 and AAP802 (see Figure 4).² Trucks have been observed parking in this area (see Photo 41) so these inlets were identified as potential pathways for contaminated solids to enter the storm system on the Front Avenue branch.

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² A review of construction drawings for the Front Avenue line did not include these catch basins. No record of construction or connection to the Front Avenue line has been found.

Analytical results indicate that petroleum hydrocarbons are present (360 mg/Kg total TPH) but are not at the elevated concentrations similar to those found at main line locations downstream.

The City concludes that the dry-weather flow pathway from the Front Avenue branch does not appear likely to be a significant source of petroleum sheen observed at Outfall 22, but that a significant source or sources of petroleum-contaminated solids is present in the upper portion of this branch. Residual solids in this branch represent a potential future source of sheen to the outfall, but likely did not contribute to the sheen observed at the outfall at the outset of this investigation on May 27, 2015. Dry-weather flow and inline solids samples collected at the downstream end of the branch did not indicate elevated TPH concentrations, and the solids with the highest concentration were deposited on the walls of the pipe above the level of the dry-weather flow.

Recommendations

This investigation was conducted in support of ongoing efforts by the BES Portland Harbor and Pollution Prevention programs to identify and control sources of petroleum contaminants to the Basin 22 conveyance system. The following recommendations are based on these findings and on available information from the DEQ Cleanup Program on work completed to date related to the ECSI sites discharging to Basin 22.

DEQ:

- 1. Require the Chevron Willbridge and Phillips 66 facilities to control contaminated groundwater discharges to Basin 22 under DEQ Cleanup Program oversight. The need for more substantive investigation and possible controls related to preferential pathways to the Doane Avenue branch was identified by the City several years ago (BES, 2012a and 2012b) but no additional work has been done.
- 2. Facilitate review and revision of the Outfall Inspection and Sheen Response Plan and involve BES Pollution Prevention in that process. It was noted during the meeting that sheen observations were not always reported to the City in a timely manner and did not meet City Code reporting requirements. City code prohibits discharge of sheen to the municipal stormwater conveyance system. Updates to the plan should include routine monitoring of Site laterals at Site manholes to determine if sheens are present.

City:

- 3. Pursue City enforcement action in response to contaminated discharges to the NW Doane Avenue storm line. Field observations and analytical results indicate that dryweather flow discharges from the Chevron Willbridge and Phillips 66 facilities warrant referral to the BES Environmental Compliance Officer for potential enforcement under City Code 17.39.040.
- 4. Clean the section of the Front Avenue branch between manholes AAP802 and AAM083 to remove contaminated inline solids and conduct post-cleaning video survey to confirm that material in pipe bottom and adhered to pipe sidewalls has been removed. Because no responsible party has been identified for contaminated solids observed in this

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- portion of the system, the City should conduct this work and pursue cost recovery if a responsible party is identified at a later date.
- 5. Consult with Maintenance Engineering regarding abandonment of the inactive connection from manhole AAP796 to manhole AAP799 on the Front Avenue branch. Line condition is poor between manholes AAM084 and AAP799 and there are no current or likely future connections to this line.
- 6. Consult with Maintenance Engineering regarding abandonment of the two catch basins in the unpaved portion of the right-of-way on the south side of NW Front Avenue, between manholes AAP799 and AAP802. No record of inlet construction was found, indicating that these inlets may have been installed by a private party without City approval. These inlets are located in an impervious area where stormwater should infiltrate, and represent an obvious source of solids loading to the Basin 22 system. Tanker truck parking has been observed in the immediate vicinity of the inlets, so abandonment will also result in increased protection from releases to Basin 22.
- 7. Communicate investigation findings on NW Front Avenue to BES Industrial Stormwater Program inspectors for the McCall/Brenntag and Chevron Asphalt sites for follow up and technical assistance on identifying potential onsite sources to the NW Front Avenue branch. NPDES industrial stormwater permits are in place at the McCall, Brenntag, and Paramount Petroleum (operator at the former Chevron Asphalt site) facilities and routine inspections occur. Inspectors should confirm that illicit batch discharging to the system of petroleum-contaminated water is not occurring.
- 8. Obtain results of USCG samples collected during this investigation to determine if their data indicate any additional potential source areas or pathways.
- 9. Continue to implement sample collection protocols during sheen response events, and consider analyzing water samples for PAHs (at low detection limits) in addition to the TPH scan. Future data during actual sheen events will help to pinpoint ongoing sheen sources to the system. PAH analyses per method SM8270-SIM can attain lower method reporting limits than the NWTPH quantification methods, and DEQ screening level values for PAHs are available for data evaluation.

This investigation met the objective of identifying potential sources and pathways for petroleum sheen to enter the Basin 22 conveyance system. Response actions by identified sources, DEQ, and the City are needed to address investigation findings.

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Tables

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Figures

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Figure 3 - Outfall Basin 22 ECSI Site Stormwater Connections

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Figure 5 - TPH in Basin 22 Inline Solids and Sediment Adjacent to OF-22

Figure 6 - TPH and Total PAHs in Basin 22 Dry-Weather Flow

Figure 7 – TPH in Basin 22 Surface Wipes

Figure 8 - DEQ Guidance Curve for Total PAHs in Stormwater at Portland Harbor Heavy Industrial Sites and Basin 22 Dry-Weather Flow Data

Attachments

Attachment A - Outfall 22 Petroleum Sheen Investigation Sampling Plan

Attachment B - Photographs

Attachment C - Field Notes

Attachment D - Laboratory Results

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Table 1. Sampling Locations

System	Sample	Sample	- · · ·
Branch	Location	Code	Description
Outfall Sedin	nent Sample		
Outfall	OF-22	22_8	Composite of 3 subsamples collected between end of outfall pipe and river edge.
Inline Solids	Samples		
	AAM080	22_11	Upstream of manhole in 48" main.
	A A N 1075	22_14	Shelf in west side of manhole chamber with mineral deposit at seep area.
D	AAM075	22_16	Upstream of manhole in 48" main.
Doane Ave.	AAM076	22_18	Downstream of manhole in 48" main.
1110.	AAM086	22_19	Downstream of manhole in 48" main.
	AAP794	22_28	Downstream of manhole in 48" main.
	AAP791	22_33	Upstream of manhole in 27" main.
	AAM078	22_34	Upstream of manhole in 30" main.
	A A D700	22_36	Downstream of manhole in 30" main.
	AAP799	22_37	Upstream of manhole in 15" lateral line from the southwest.
Front Ave.	AAP796	22_38	Upstream of manhole in 8" lateral from north.
Trone rive.	Unmapped CB	22_41	Catch basin in gravel area connected to main between AAP799 and AAP800.
	AAP800	22_39	Upstream of MH in 18" main.
	ANF249	22_40	Catch basin in gravel area connected to catch basin ANF248.
Dry-Weather	· Flow Samples		
Outfall	OF-22	22_8W	Discharge from OF-22 (AAM079).
Outrair	AAM077	22_9W	Flow in 60" line discharging from manhole.
	AAM077	22_4W	Flow in 48" line entering manhole from Doane Ave. line.
	AAM080	22_10W	Water pooled in manhole invert.
	A A N 4075	22_15W	Flow in 48" line discharging from manhole.
	AAM075	22_13W	Flow in lateral line entering from the north (i.e., 'Chevron #1').
Doane	APA018	22_21W	Flow from beneath lateral line (i.e., between lateral pipe and sidewall of 48" main) entering from the south (i.e., 'Phillips #2').
Ave.	APA016	22_22W	Water pooled in manhole invert.
	AQB059	22_24W	'Chevron #2.' Water pooled in manhole invert.
	A A D704	22_27W	Flow in 12" lateral line entering from the south (i.e., 'Phillips #3').
	AAP794	22_29W	Flow in 36" main line entering manhole (i.e., Doane Ave. main).
	AAP792	22_32W	Flow in 12" lateral line entering from the north (i.e., Chevron #3').
	AAP791	22_6W	Flow in manhole invert.
Front Ave.	AAM077	22_5W	Flow in 30" line entering manhole from Front Ave. line.
Wipe Sample	es -		
		22_14Wipe	Two wet stained areas within manhole invert on elevated shelf.
Doane	AAM075	22_12Wipe	Wetted underside of lateral entering manhole from south (i.e., 'Phillips #1').
Ave.		22_13Wipe	Lateral entering manhole from north (i.e., 'Chevron #1').
	AAM076	22_17Wipe	Stain on underside of sanitary line crossing through manhole chamber.

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System Branch	Sample Location	Sample Code	Description
	APA018	22_20Wipe	Stain adjacent to upstream side of lateral entering manhole from south (i.e., 'Phillips #2').
	APA016 22_23Wipe AQB059 22_25Wipe 22_26Wipe 22_30Wipe 22_31Wipe		Stains on surface of manhole chamber below lateral from NE labeled "Scale pit/garage roof drain' (i.e., Phillips #2).
			Stain on top of 16" lateral line entering manhole from the north (i.e., 'Chevron #2').
			Stain below 6" lateral line entering manhole from the NW (i.e., 'Chevron #2').
			Orange material below perched lateral line entering line from the east (i.e., 'Phillips #3').
			Stain on shelf on east side of manhole chamber.
Front Ave.	AAM078	22_35Wipe	Wetted area at manhole collar.

Notes:

The City also collected samples for USCG at highlighted locations.

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Table 2
Basin 22 Sediment and Inline Solids Results

		Outfall				NW Doane Avenue				NW Front Avenue								
		Exposed sediments adjacent to end of Outfall 22 22_8 W15E194-01	Manhole AAM080 Upstream in 48" line 22_11 W15E194-08	Manhole AAM075 Solids from shelf 22_14 W15E194-14	Manhole AAM075 Upstream in 48" line 22_16 W15E194-15	Manhole AAM076 Downstream in 48" line 22_18 W15E194-17	Manhole AAM086 Downstream in 48" line 22_19 W15E194-18	Manhole AAP794 Downstream in 48" line 22_28 W15E199-05	Manhole AAP791 Upstream in 27" line 22_33 W15E199-11	Manhole AAM078 Upstream in 30" line 22_34 W15E199-12	Manhole AAP799 Downstream in 30" line 22_36 W15F041-01	Manhole AAP799 Upstream in 15" lateral line 22_37 W15F041-02		Unmapped Catch Basin (Connects upstream of manhole AAP799) Within catch basin 22_41 W15F041-06	Manhole AAP800 Upstream in 18" line 22_39 W15F041-04	Catch Basin ANF249 Within catch basin 22_40 W15F041-05		
Class Analyte	Units	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/28/2015	5/28/2015	5/28/2015	6/3/2015	6/3/2015	6/3/2015	6/3/2015	6/3/2015	6/3/2015		
Total Solids (EPA 160.3M)																		
TS	%	77.5	79.2	51.4	58.0	80.4	82.5	73.0	81.5	85.0	76.5	72.2	82.4	80.1	58.3	62.9		
Total Petroleum Hydrocarbons Scan (N	IWTPH-HCID)																	
Diesel	mg/Kg	DET	ND	ND	DET	ND	ND	ND	ND	ND	DET	DET	DET	ND	DET	DET		
Gasoline	mg/Kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	DET J	DET	ND	ND	ND	ND		
Lube oil	mg/Kg	ND	ND	ND	DET	ND	ND	DET	DET	DET	DET	DET	DET	DET	DET	DET		
Total Petroleum Hydrocarbons - Diesel	& Oil (NWTPH-Dx)																	
Diesel	mg/Kg	81 J	NA	NA	78	NA	NA	28 U	25 U	26 U	2,100 J	3,100 J	120 J	30 J	37,000 J	33 U		
Lube oil	mg/Kg	110 J	NA	NA	220	NA	NA	200	130	190	4,800	8,300	770	330	86,000 J	360		
Total Petroleum Hydrocarbons - Gasoli	ine (NWTPH-Gx)																	
Gasoline	mg/Kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	156 J	140 J	NA	NA	NA	NA		

Notes:

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DET = Detected

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

NA = Not analyzed or not applicable

ND = Not detected

U = The analyte was not detected above the reported sample quantification limit.

mg/Kg = Milligrams per kilogram.

Table 3 Basin 22 Dry-Weather Flow Results

		Outfa	ll Main		NW Doane Avenue										NW Front Avenue	JSCS Water SLVs ⁽¹⁾		
		End of outfall (Node AAM079) DWF from outfall 22_8W W15E194-02	Manhole AAM077 DWF downstream in 60" line 22_9W W15E194-03	Manhole AAM077 DWF upstream in 48" line 22_4W W15E194-04	Manhole AAM080 Surface sheen within manhole 22_10W W15E194-06	Manhole AAM075 DWF downstream in 48" line 22_15W W15E194-12	Manhole AAM075 DWF upstream in Chevron #1 lateral line 22_13W W15E194-13	Wye APA018 DWF at connection of Phillips #2 lateral line 22_21W W15E194-20	Manhole APA016 Surface sheen within manhole 22_22W W15E194-21	Manhole AQB059 DWF within manhole on Chevron #2 lateral line 22_24W W15E199-01	Manhole AAP794 DWF upstream in 36" line 22_29W W15E199-06	Manhole AAP794 DWF upstream in Phillips #3 lateral line 22_27W W15E199-04	Manhole AAP792 DWF upstream in Chevron #3 lateral line 22_32W W15E199-09	Manhole AAP791 DWF within manhole 22_6W W15E194-02	Manhole AAM077 DWF upstream in 30" line 22_5W W15E194-05	Human Health Fish	Human Health	1
ass Analyte	Units	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/28/2015	5/28/2015	5/28/2015	5/28/2015	5/28/2015	5/27/2015	Consumption ⁽²⁾	(0)	Ecological ⁽
eld Measurements																		
Conductivity	µmhos/cm	309	NA	NA	322	324	679	482	187	254	184	103	173	194	NA		-	
lycyclic aromatic hydrocarbons (PAHs) (EPA	1 8270 SIM I	1)																
1-Methylnaphthalene	μg/L	0.11	0.18	0.16	0.19	0.14	0.18	2.2 U	2.1	0.040 U	0.079	0.051	0.040 U	0.040 U	0.040 U			
2-Methylnaphthalene	μg/L	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.080 U	2.0 U	0.20	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U		0.2	
Acenaphthene	μg/L	0.83	1.1	1.0	1.1	0.82	0.90	8.4	0.56	0.020	0.20	0.12	0.020 U	0.020 U	0.020 U	990	0.2	520
Acenaphthylene	μg/L	0.20 U	0.22 U	0.20 U	0.24 U	0.20 U	0.20 U	2.5 U	0.17	0.060 U	0.060 U	0.060 U	0.020 U	0.020 U	0.020 U		0.2	
Anthracene	μg/L	0.17	0.21	0.19	0.29	0.14	0.026	1.5	0.20	0.10	0.12	0.075	0.047	0.23	0.020 U	40000	0.2	0.73
Benzo(a)anthracene	μg/L	0.010	0.021	0.013	0.19	0.063	0.010 U	0.50	0.89 Ј	0.037	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.018	0.092	0.027
Benzo(a)pyrene	μg/L	0.010 U	0.011	0.010 U	0.13	0.09	0.010 U	0.32	1.1 J	0.058	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.018	0.0092	0.014
Benzo(b)fluoranthene	μg/L	0.010 U	0.014	0.010 U	0.15	0.13	0.010 U	0.34	1.6 J	0.11	0.013	0.010	0.010 U	0.010	0.010 U	0.018	0.092	
Benzo(g,h,i)perylene	μg/L	0.010 U	0.010 U	0.010 U	0.11	0.09	0.010 U	0.27	1.3 J	0.15	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U		0.2	
Benzo(k)fluoranthene	μg/L	0.010 U	0.010 U	0.010 U	0.031	0.044	0.010 U	0.12	0.88 J	0.037	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.018	0.2	
Chrysene	μg/L	0.013	0.028	0.014	0.26	0.097	0.010 U	0.73	1.4 J	0.071	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.018	0.2	
Dibenzo(a,h)anthracene	μg/L	0.01 U	0.010 U	0.010 U	0.030	0.020	0.010 U	0.080	0.54 J	0.019	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.018	0.0092	
Fluoranthene	μg/L	0.053	0.085	0.058	0.51	0.15	0.016	1.6	2.0 J	0.098	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	140	0.2	
Fluorene	μg/L	2,2	2.7	2.5	2.4	1.8	1.6	21	0.85	0.030 U	0.47	0.26	0.020 U	0.020 U	0.025	5300	0.2	3.9
Indeno(1,2,3-cd)pyrene	μg/L	0.01 U	0.010 U	0.010 U	0.054	0.070	0.010 U	0.14	0.99 Ј	0.063	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.018	0.092	
Naphthalene	μg/L	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.80 U	4.0 U	1.2 U	0.040 U	0.20 U	0.080 U	0.040 U	0.040 U	0.040 U		0.2	620
Phenanthrene	μg/L	2.1	2.7	2.4	3.4	1.2	0.16	29	1.3	0.043	0.11	0.12	0.020 U	0.020 U	0.020 U		0.2	
Pyrene	μg/L	0.10	0.16	0.11	0.91	0.21	0.043	2.8	2.1 J	0.20	0.016	0.010	0.010 U	0.010 U	0.010 U	4000	0.2	
Total PAHs ⁽⁵⁾	μg/L	5.6	7.2	6.4	9.8	5.1	2.9	67	18	1.0	1.0	0.65	0.047	0.24	0.025		-	
otal Petroleum Hydrocarbons Scan (NWTPH-	-HCID)																	
Diesel	mg/L	DET J	DET J	DET J	DET J	DET J	DET	DET	DET	DET	ND	ND	ND	ND	ND			
Gasoline	mg/L	ND	ND	ND	ND	ND	ND	DET J	ND	ND	ND	ND	ND	ND	ND			
Lube oil	mg/L	DET J	DET J	DET J	DET J	DET J	ND	DET J	DET	DET	ND	ND	ND	ND	ND		-	
tal Petroleum Hydrocarbons - Diesel & Oil (NWTPH_Dv																·	
	mg/L	2.0 Ј	3.0 J	1.3 J	1.9 J	0.93 J	0.49	130 Ј	1.7 J	0.48	NA	NA	NA	NA	NA			
Diesel				1.5 0	1.,, 0	0.75 0	0.17	150 0	1.7 0	0.10								
Diesel Lube oil	mg/L	0.57 J	0.69 J	0.28 J	0.25 J	0.46 J	0.13 U	15 U	2.7 J	1.4	NA	NA	NA	NA	NA			

DET = Detected

DWF = Dry-weather flow

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

NA = Not analyzed ND = Not detected

U = The analyte was not detected above the reported sample quantification limit.

umhos/cm = micromhos per centimeter

 μ g/L = Micrograms per liter

mg/L = Milligrams per liter

(1) JSCS SLVs = Portland Harbor Joint Source Control Strategy Screening Level Values (DEQ/EPA Final December 2005, Amended July 2007)

(2) The SLVs for chemicals in water taken up by fish for human consumption represent EPA's NRWQC values. If no NRWQC values are available, then DEQ's AWQC values are listed for the constituent.

 $^{(3)}$ The SLVs for chemicals in water for human ingestion represent the most conservative value between EPA's MCLs and Region 9 PRGs.

(4) The SLVs for chemicals in water for ecological exposure represent EPA's NRWQC values. If no NRWQC values are available, then DEQ's AWQC values are available, then DAQ values are available available

 $^{(5)}\!\text{Total PAHs}$ are calcualted by assigning "0" to undetected constituents.

"--" = No JSCS screening level available

= Highlighted values have been selected by DEQ for initial upland source control screening evaluations.

bold = Concentration exceeds DEQ's SLV

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Table 4
Basin 22 Wipe Sample Results

		NW Doane Avenue											
		Manhole AAM075 Sheen on shelf 22_14Wipe W15E194-11	Manhole AAM075 In Chevron #1 lateral line 22_13Wipe W15E194-10	Manhole AAM075 In Phillips #1 lateral line 22_12Wipe W15E194-09	Manhole AAM076 Underside of sanitary lateral line 22_17Wipe W15E194-16	Wye APA018 At connection of Phillips#2 lateral line 22_20Wipe W15E194-19	Manhole APA016 Stain below lateral line entering Phillips #2 lateral from northeast 22_23Wipe W15E194-22	Manhole AQB059 Stain above 16" inlet to Chevron #2 lateral 22_25Wipe W15E199-02	Manhole AQB059 Stain below 6" perched inlet to Chevron #2 lateral 22_26Wipe W15E199-03	Manhole ANV453 Stain below east lateral line to Phillips#3 lateral 22_30Wipe W15E199-07	Manhole ANV453 Stain on east shelf of invert in Phillips #3 lateral 22_31Wipe W15E199-08	Manhole AAM078 Manhole collar 22_35Wipe W15E199-13	
Class Analyte	Units	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/27/2015	5/28/2015	5/28/2015	5/28/2015	5/28/2015	5/28/2015	
Total Petroleum Hydrocarbons Scan (NWTPH-HCID))												
Diesel	mg/wipe	ND	ND	ND	ND	DET	ND	ND	ND	ND	DET	ND	
Gasoline	mg/wipe	ND	ND	ND	ND	DET J	ND	ND	ND	ND	DET J	ND	
Lube oil	mg/wipe	ND	ND	ND	ND	DET J	ND	ND	ND	ND	DET J	ND	
Total Petroleum Hydrocarbons - Diesel & Oil (NWTP	H-Dx)												
Diesel	mg/wipe	NA	NA	NA	NA	290 J	NA	NA	NA	NA	420 J	NA	
Lube oil	mg/wipe	NA	NA	NA	NA	62 U	NA	NA	NA	NA	110 U	NA	

Notes:

DET = Detected

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

NA = Not analyzed or not applicable

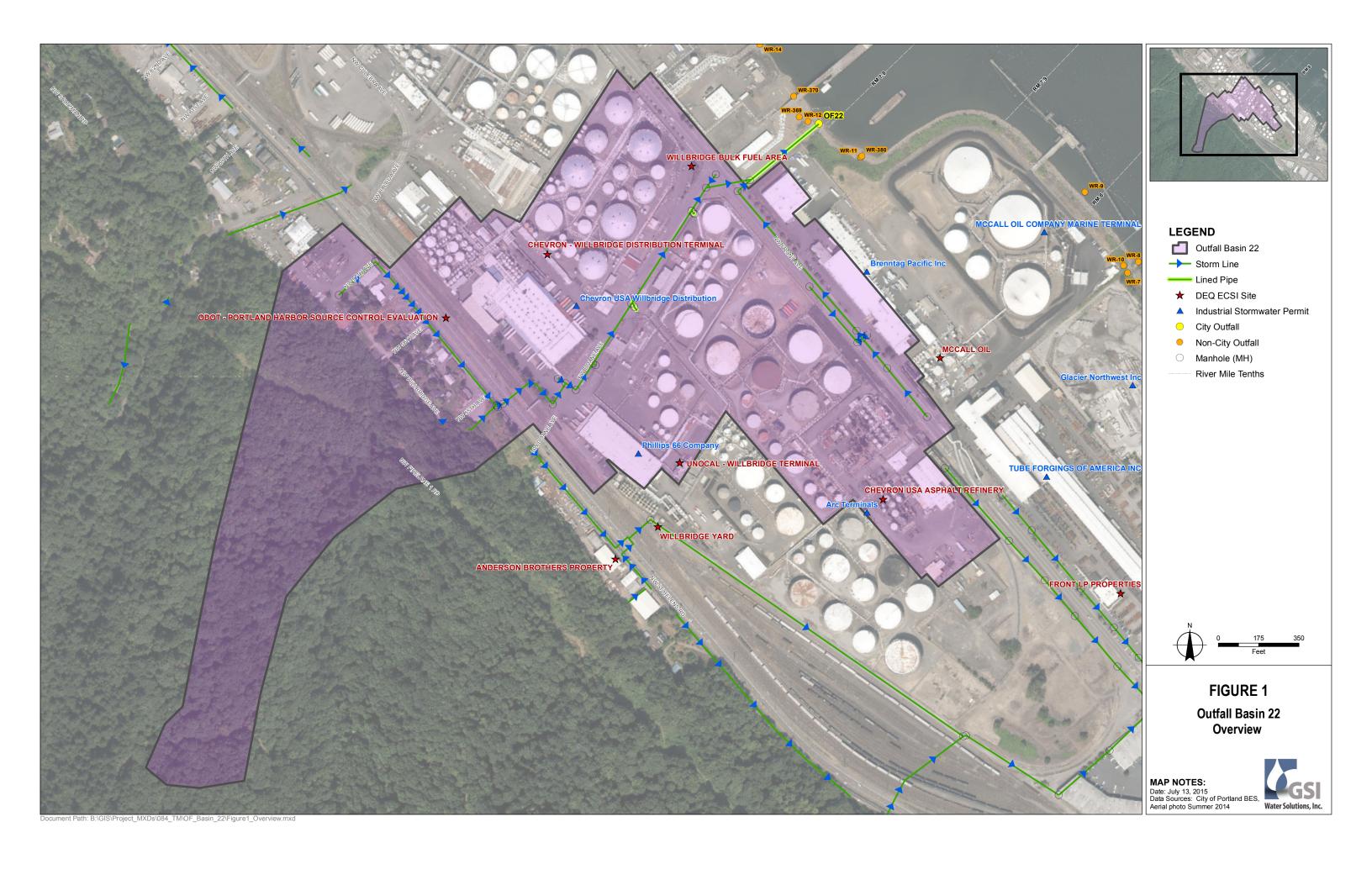
ND = Not detected

U = The analyte was not detected above the reported sample quantification limit.

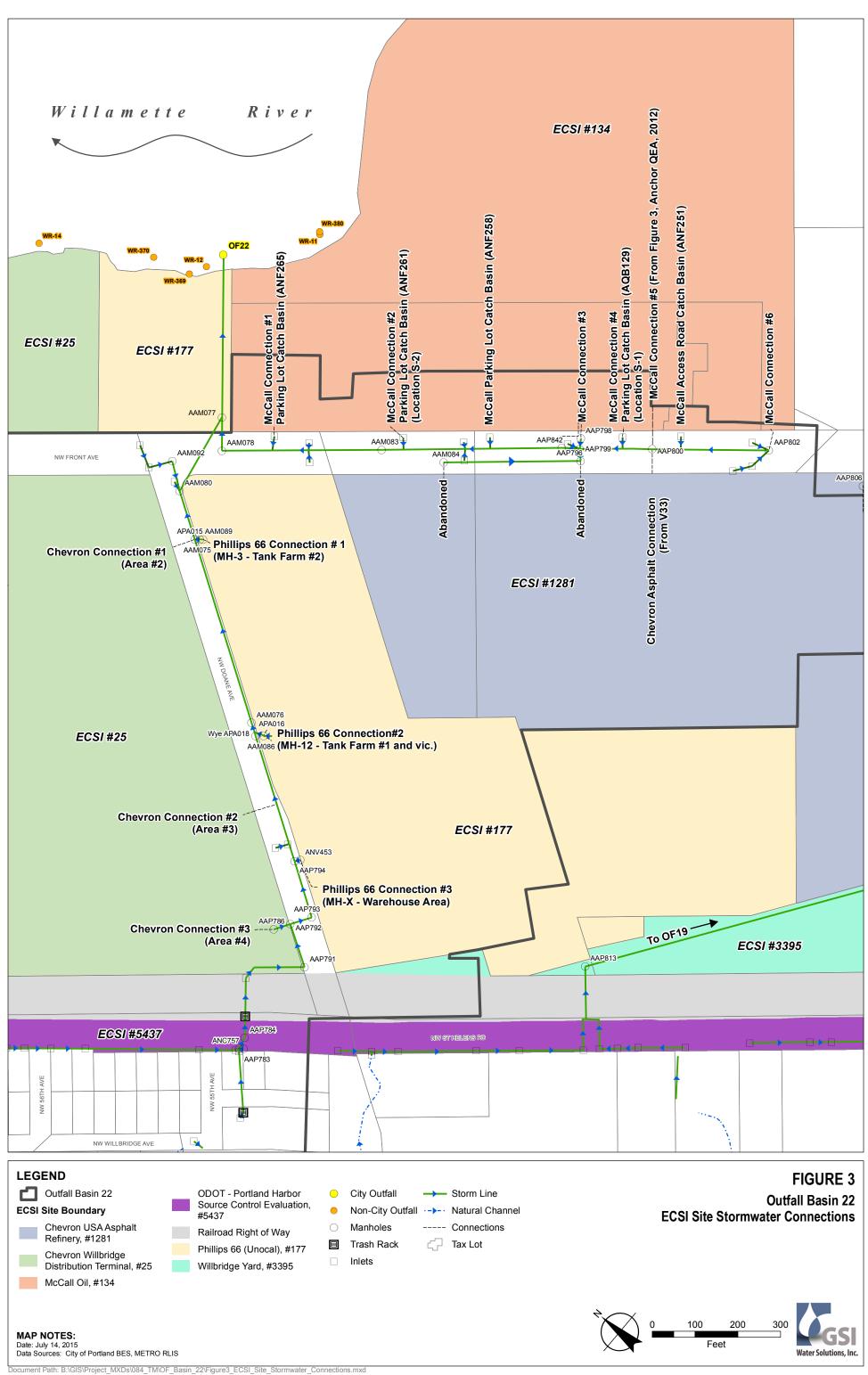
mg/wipe = Milligrams per wipe

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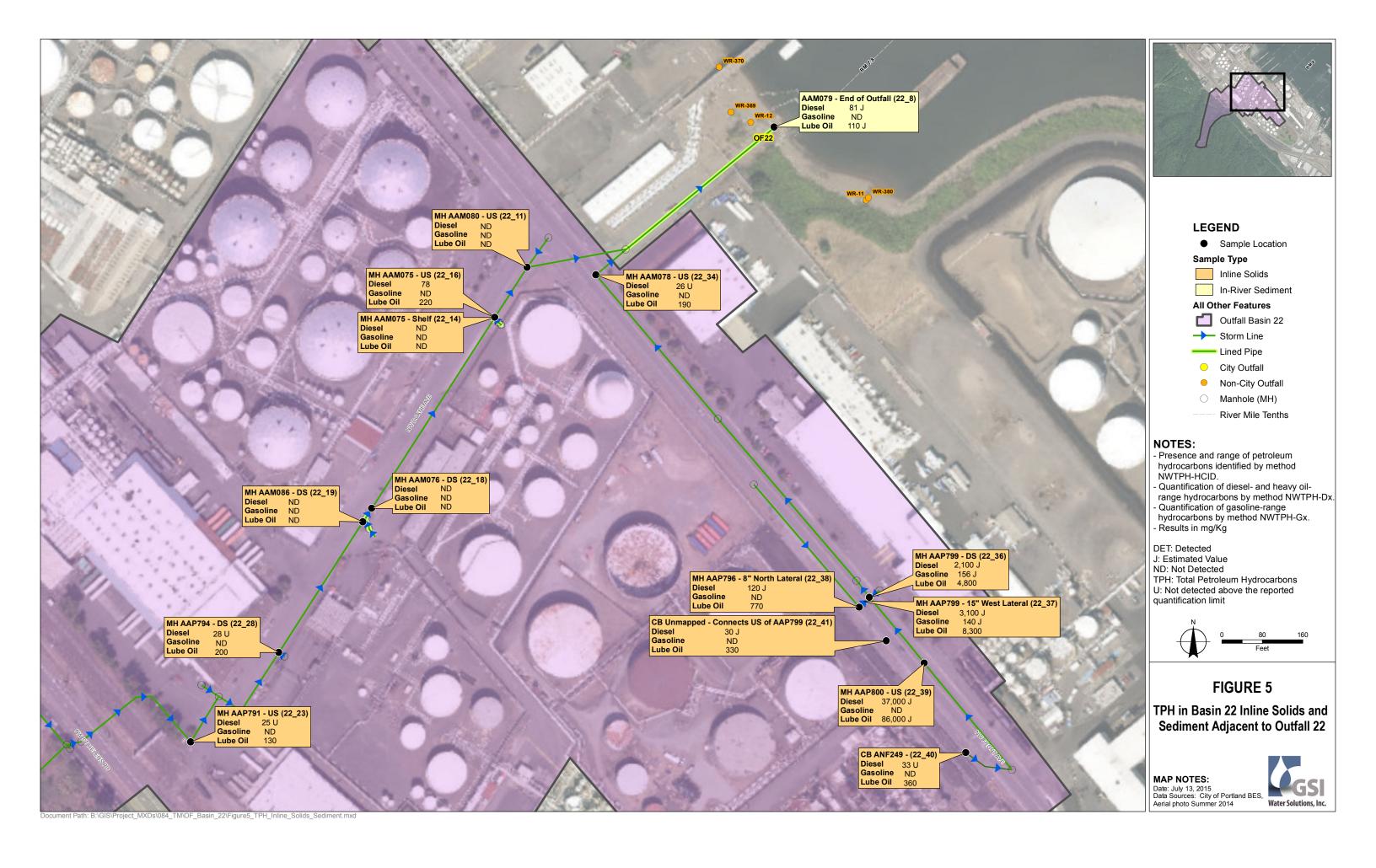


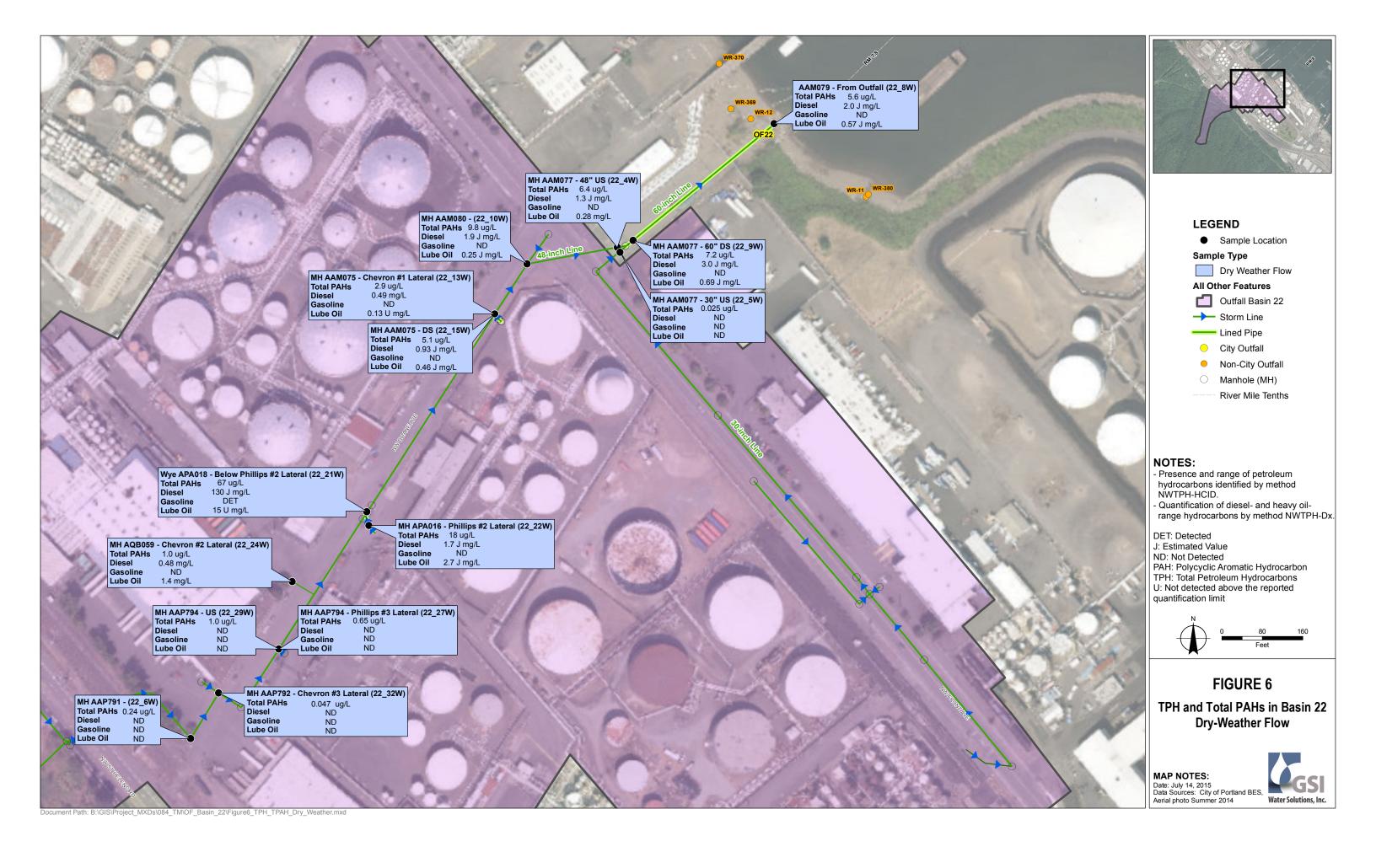




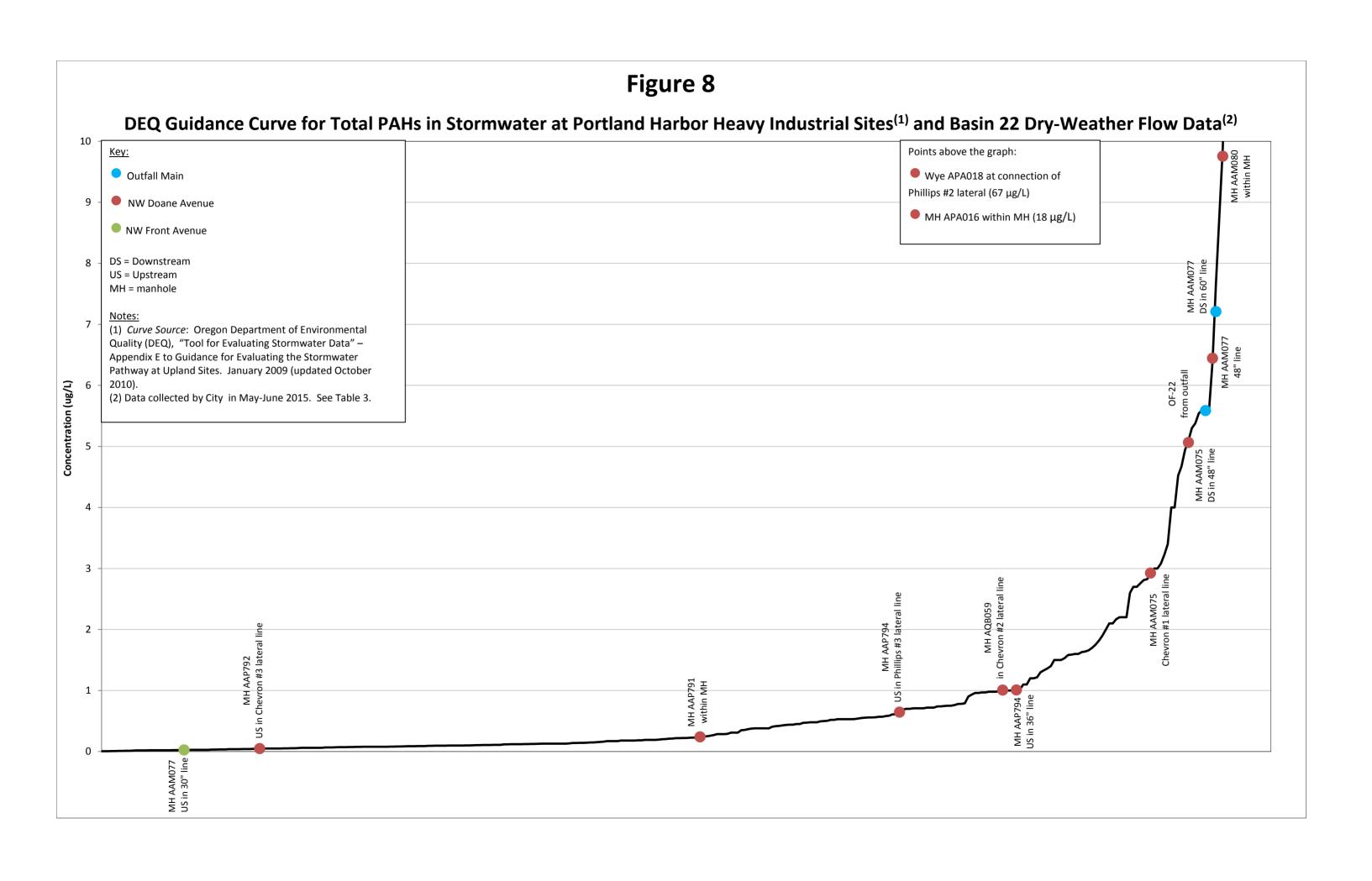












Attachment A Outfall 22 Petroleum Sheen Investigation Sampling Plan

City of Portland Bureau of Environmental Services Outfall 22 Petroleum Sheen Investigation Sampling Plan May 20, 2015

Background

A petroleum sheen has been repeatedly observed in the Willamette River in the vicinity of stormwater Outfall 22 (OF-22). OF-22 serves an approximately 95-acre area consisting mainly of Forest Park and the Willbridge industrial area. The industrialized portion of the basin is almost entirely comprised of sites that are being investigated (or were investigated) under the Oregon Department of Environmental Quality (DEQ) Cleanup Program. Although it is not yet known whether or not past sheens resulted from discharges from the outfall, analysis of a samples collected directly from the outfall, in response to a sheen on May 5, 2015, indicated a small amount of diesel and lube oil in the discharge to the river, 1.3 mg/L and 0.52 mg/L respectively. The City, the United States Coast Guard (USGS), DEQ, and representatives from the Willbridge bulk oil terminals recently met to discuss a collaborative approach for identifying and controlling petroleum discharges to the river via OF-22.

Objective

The purpose of this investigation is to collect samples throughout the portion of the Basin 22 conveyance system that serves the Willbridge bulk oil terminals to identify possible sources for the petroleum sheen so that appropriate controls can be selected and implemented. The investigation includes two primary components: 1) a comprehensive dry-weather investigation of the system and connections to it based on review of recent video surveys conducted by the City and 2) sheen-response investigations to trace sheen sources while the sheen is occurring. For the dry-weather investigation, dry-weather water samples, inline sediment samples and wipe samples of dark stains will be collected at numerous locations throughout the basin. In addition, if river levels allow, a composite sample of sediment at the end of the outfall will be collected to help ascertain if observed sheens may be resulting from agitation of contaminated inriver sediment during basin discharge conditions. For the sheen-response investigation, water samples will be collected as needed from Basin 22 and connecting private systems.

USCG Coordination

During the recent meeting regarding the petroleum sheens in the vicinity of OF-22, the USCG indicated that it would like to partner with the City on the investigation. Anticipated coordination for the investigation includes but is not limited to: observing City field investigations, providing and analyzing hydrophilic nets to assist with source tracing, and collecting and analyzing split samples for forensics analysis.

Inline Sediment and Dry-weather Flow Sampling Locations

Figure 1 is an area map of Basin 22, which contains a small portion of NW Front Ave, NW Doane Ave and a portion of NW St Helens Rd. TV inspections conducted by the City of Portland in April and May

2015 identified several areas with inline sediments and infiltration of groundwater. Figure 2 below is a map of the identified locations for potential sampling. Additionally, we will investigate each manhole as we move up the two main branches of the basin (i.e., the Doane Avenue branch and the Front Avenue branch) and will collect samples from other locations based on field observations.

Dark Stain Wipe Sampling Locations

The TV inspections also identified several locations with dark stains on the walls within the storm line. Wipe samples will be collected from the dark stains to determine if there are possible petroleum sources to the basin. Figure 3 below is a map with the identified locations, but again, as we move up the basin we may identify additional dark stains to be sampled or may determine that locations identified in the survey don't actually warrant sampling.

Inriver Sediment Sampling Location

If river levels allow access to the end of the outfall, and sediment is present in the vicinity of the outfall via shoreline access, one composite sample will be collected from a minimum of three points near the end of the outfall.

Analytical Scope

All samples will be analyzed at the City of Portland Water Pollution Control Laboratory for NWTPH-HCID (Hydrocarbon Scan) with NWTPH-Dx (Diesel and Oil Range) and NWTPH-Gx (Gasoline Range) follow-up analysis if detected in the hydrocarbon scan. The dry-weather flow samples will also be analyzed for PAHs by method EPA 8270-SIM.

Field Protocols and Documentation

Inline Sediment sampling and dry-weather flow sampling will done in accordance with the City of Portland Field Operations Standard Operating Procedures (SOP 2.02a - Grab Sample with Bottle, SOP 2.02b - Grab Sample Collection with Stainless Steel Beaker and SOP 5.02a - Inline Sampling of Stormwater Solids). Soil sample collection near the outfall will be done in accordance with the Field Operations SOP 5.01a - Sampling of Soil and Sediment. Currently the City of Portland does not have an SOP for wipe sampling but we have performed a similar sampling for a previous project. City of Portland staff will record and take photos of all observations. Field Data Sheets will be completed documenting the conditions and characteristics of each sample collected.

In addition to collecting samples, field staff will assess locations within the system and at connecting laterals for potential deployment of hydrophilic nets or other oil absorbents to meet sheen response objectives. If suitable locations and deployment methods are identified, deployment may occur at the time of entry or during field activities scheduled at a separate time.

Quality Assurance and Control

To demonstrate that there is no cross-contamination due to equipment decontamination and airborne inputs two Field Decontamination Blank samples will be collected at a selected location. One sample from the stainless steel bowls used for inline sediment sample homogenization and the other from stainless steel bailers used for dry-weather flow sampling following the City of Portland Field

Operations SOP 7.01c - QC Sample Collection. The WPCL will also analyze an unused wipe to determine if there is any contribution of hydrocarbons from the wipes themselves.

Data Reporting and Evaluation

The WPCL will generate lab reports with results and a qualitative narrative explaining the interpretation of the NWTPH chromatograms. WPCL staff will review chromatograms and generate charts showing comparisons of the Outfall 22 sample with samples collected from points within the basin. The intent is to identify any sources that appear to match the chromatogram pattern that we are seeing at the outfall. If samples are collected and analyzed by other parties (e.g., USCG forensics), these data will be shared with the City to facilitate data evaluation.

Schedule and Target Conditions

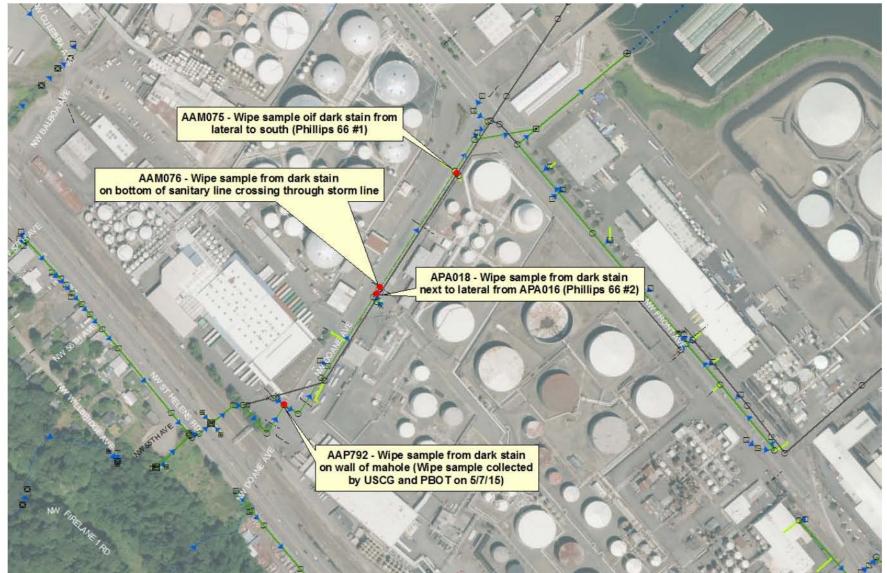
The comprehensive investigation will occur on a dry day to avoid dilution of dry-weather flows and to allow for field staff to enter system without lateral discharges and elevated flow in lines. The investigation and sampling is estimated to require two to three days to complete. Due to traffic control issues, investigation of the manholes on NW Front Ave may require additional staff for flagging. The sheen response investigation will be conducted on an as-needed basis regardless of weather conditions.

Project Management

The dry-weather investigation will be directed by Linda Scheffler from the Portland Harbor section. A formalized report summarizing the findings will be disseminated to all of the parties involved. The sheen response investigations will be led and documented by Mark Walla of the Spill Response section and provided to Linda for potential inclusion in the summarized report. Mark Walla will also continue as the contact for coordination with the US Coast Guard.

Figure 1 – Stormwater Basin 22 Area Map





Attachment B Field Photographs

Basin 22 Dry-Weather Sheen Investigation



Photo 1 (May 27, 2015). Willbridge Cove and boomed area around Outfall 22.



Photo 2 (May 27, 2015). Sediment sampling at Outfall 22.



Photo 3 (May 27, 2015). Boomed area with sheen around Outfall 22.



Photo 4 (May 27, 2015). Manhole AAM077. Lined 60" discharge pipe.



Photo 5 (May 27, 2015). Manhole AAM077. Incoming 48" line from NW Doane.



Photo 6 (May 27, 2015). Manhole AAM077. Incoming 30" line from NW Front.

Doane Avenue Branch

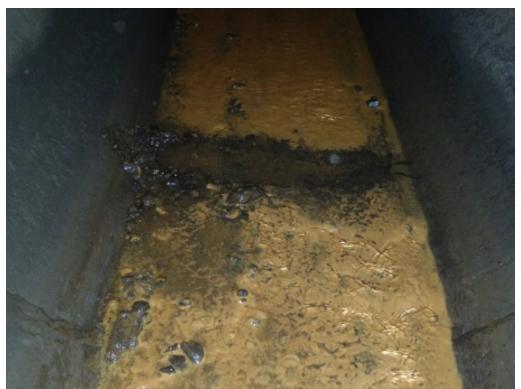


Photo 7 (May 27, 2015). Manhole AAM080. Incoming 48" line where inline solids sample was collected.



Photo 8 (May 27, 2015). Inline solids collected from AAM080.



Photo 9 (May 27, 2015). Manhole AAM075. Chevron #1 lateral connection with dryweather flow and staining.



Photo 10 (May 27, 2015). Manhole AAM075. Phillips #1 lateral connection with dryweather flow and staining.



Photo 11 (May 27, 2015). Manhole AAM075. Inline solids sample location in incoming main line.



Photo 12 (May 27, 2015). Manhole AAM075. Inline solids and seepage on manhole shelf.

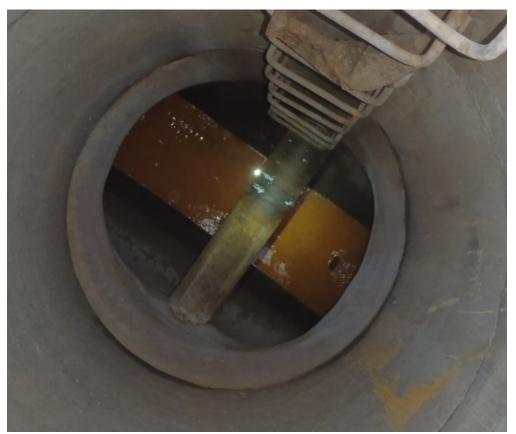


Photo 13 (May 27, 2015). Manhole AAM076. Sanitary lateral bisecting invert.



Photo 14 (May 27, 2015). Manhole AAM076. Wipe sample location on sanitary lateral.



Photo 15 (May 27, 2015). Wye APA018. Phillips #2 lateral. Dry-weather flow sample from seep underneath left side of pipe and wipe sample from stain to right of pipe.



Photo 16 (May 27, 2015). Wye APA018. Dry-weather flow sample with suspended droplets from underside of Phillips #2 lateral connection.



Photo 17 (May 27, 2015). Manhole APA016. Wipe sample.



Photo 18 (May 27, 2015). Manhole AAM086. Location of inline solids sample from outgoing line. Phillips #2 lateral on top right.



Photo 19 (May 28, 2015). Private manhole access to lateral AQB059 (Chevron #2). Incoming line at bottom, outgoing line to NW Doane at top.



Photo 20 (May 28, 2015). Private manhole on lateral AQB059 (Chevron #2). Foamy material in manhole invert and boom in outgoing line.



Photo 21 (May 28, 2015). Manhole AAP794. Phillips #3 lateral with dry-weather flow entering main line from south.



Photo 22 (May 28, 2015). Manhole AAP794. Inline solids sample collected from 48" main line downstream of manhole and Phillips #3 connection.



Photo 23 (May 28, 2015). Manhole ANV453. Evidence of groundwater infiltration in Phillips #3 connection.



Photo 24 (May 28, 2015). Manhole ANV453. Location of sample 22_30Wipe in manhole chamber along Phillips #3 lateral.



Photo 25 (May 28, 2015). Manhole AAP792. Dry-weather flow collected from Chevron #3 lateral entering chamber at top of picture.



Photo 26 (May 28, 2015). Manhole AAP791. Inline solids upstream of invert.



Photo 27 (May 28, 2015). Manhole AAP791. Dry-weather flow collected from manhole. Flow direction is from left to right.

Front Avenue Branch



Photo 28 (May 28, 2015). Manhole AAM078. Inline solids upstream of manhole in 30-inch line.

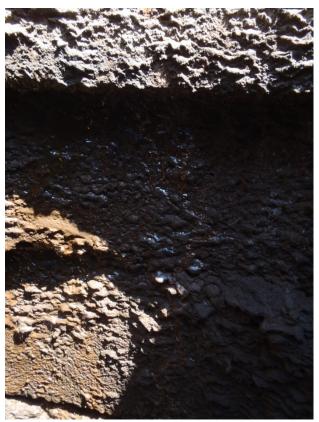


Photo 29 (May 28, 2015). Manhole AAM078. Wipe sample location in manhole collar.



Photo 30 (June 3, 2015). Manhole AAP799. Inline solids downstream of manhole.



Photo 31 (June 3, 2015). Manhole AAP799. Inline solids in 15" lateral from west.



Photo 32 (**June 3, 2015**). Manhole AAP796. Inline solids in 8" lateral from north. Chevron confirmed that all connections to this line have been abandoned.



Photo 33 (June 3, 2015). Manhole AAP800. Inline solids caked on sidewalls upstream of manhole. Similar solids not present in bottom of line. Sample collected from walls.



Photo 34 (June 3, 2015). Manhole AAP800. Inline solids not present on pipe walls or bottom downstream of manhole.



Photo 35 (**June 3, 2015**). Manhole AAP802. Inline solids present in small quantity, but gravelly and not similar to solids observed upstream of AAP800.



Photo 36 (June 3, 2015). Manhole AAP802. Inline solids not present in significant quantity in downstream main line.



Photo 37 (June 3, 2015). Unnamed catch basin on south side of NW Front between manholes AAP799 and AAP800.



Photo 38 (June 3, 2015). Unnamed NW Front catch basin with solids and debris.



Photo 39 (May 27, 2015). Catch basin ANF249.



Photo 40 (June 3, 2015). Catch basin ANF249. Solids and debris prior to sampling.



Photo 41 (May 27, 2015). Evidence of truck parking and erodible soil dragout in vicinity of catch basin ANF249 and unnamed catch basin on south side of NW Front Avenue.

Attachment C Field Notes

DAILY FIELD REPORT





Page Project Portland Hunber Project No. Date 5/37/15 Location Bosin 22 Subject Basin 22 Dury-weather scroleum sheen inv. By MTS, WCR, JFG representatives at Phillips 66 office to access OF 22 923-DFZZ-arrive at AAM 079 to collect sedirent composite sample from near outtalloand dry-weather flow sample 979 - Sed sample collected (ZZ-8) Dy wrather Flow sample collected from outfall light poroleum of outto - Slight sheen visible in sample bailerand in stainless sheet -Solitsedinantsanglimith USCG 0948- Arrive at AAMOTT, UB, ble iron bacteria coming from 48 home by petro rum order coming From manholes laron of VIV t stort at liver on outlet 60" of dry-weather from AAMOTT outlet 60" live Stight petroleumodor and light vollow color: 122-9W at dog-weather flow From 48" in let from Doone Ave. Has a yellow color and petroleum orlor. No visible It I upstroom in 48" Time of dry-weether Flow four 30" intel Very small amount of flow. Flow, & clear and no order. with stain upstrom in 30" live, deemed not worth wipe samplas **Attachments**

City of Portland Environmental Services



Project Vorfland Harbor Location OF 22 Sheen Investigation	Project Ng. Date 3/27/5 By PHF/MJS/WCR/JFG
1031- Arigo at AAMO80- Staspert flow with in	from bucteria color
Houting an CU face of Starling water.	Jat + 18W. Oily screw
들어가 맞아도 가진 말 소스리가 모음을 보았다. 그 사이 가게 된다 가면 목록 이 가는 생생이라는 데이터 작용했다. 제	
1044 - Collected Sheen net, for USCO From Sheen water sangle	on sortace at stability
le, 한테막 하다는 한 사내에서 이 나는 나는 다 한 하다는 소리를 보는 하는 다음을 하는 것도록	
1049 - Collected wher sample at sheen material in sort Petroleum phor in sample, Approx. 1" of flow.	face of stating water.
- totalcom ofor in Sample, Approx. I at Tlow.	<u>CC_1009)</u>
- Flow appears to pick-up downstream of mahale	and there are mosolids
- Flow appears to pick-up downstream of mahorle - Sedinent extends upstream as far as the a 105-Calleded in the sed saught from upstream of	ye can see, Ave depth 132
1110- Acrived at AAMO75 standing water in mi Visible. No abvious Flow coming from APAO18	n with prange ion beederic
Visible. No obvious flow coming from AVAOIS	
1/21- Collectory Field Decon Blank prior to cutry	at AAMO75.
APAOIS Straht Flow from (herror later	to sroth towards of to with Vo solids
in either Aline. Shown on leave my be co	in from joint with incoming
Ive, lated	
Attachments	



Project Grant Landow	Project No.
Location OF27	Date 5/27/15
Subject OFZZ Dry-weather Petroloun Shoon Inv	By PHAMJE WER SFG
Subject 77 2 4 7 7 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Dy Tillattio 21-
LANOIS- betook to south	
1140 - Collected wipe sample from wetled under:	side of PUC lateral from
South (Phillips (06+1) from APAOIS, Hiso coll	listed wipe suple for USCG.
No flow in lateral. Appears to clean winter	(77_12W.pe)
1147-AAMO75 lateral to worth - collected wife so	L. from lates I be worth
From Chron# at the end of the pipe at now	I de la constante de la consta
Them Chilon fact the Fire of the prise in man	My6 evamper. La Hearta
wipe souple for USCG. (22-13Wipe)	
11832 Armore List of International	VIII Cara Ola Com
1153 - AAM 075 - noverial on Shelt below ladder - (Mercy 41. pe says to The
material an shelf that his a sheen. There is a	
on shelf with dark staining. Wipe sample collect	Arch Trom both spots
on single wipe. Collected sixilar wipe sample for	VSCG. (CC-TTW-PC)
ILLE VIVE VIVE TO THE MENTION	
1159-AAM075-DS-collected water sample from	downstrem in min 48 line
	(02 12 1)
1201-AAMO75-lated to worth-collected dry wear	ther flow samp to (CC-15W)
1209-AAM075-Streft-collected sedin	gut sample from five
SUbsamples across shelt. Orange color, mirer	al prodptite (22-14)
1212- Sediment is US and on slaves & shoulder	of pipe Collectory
Souple of sedirent US of membre. 4" stip our	south side extends US
as forces com see. Appears live deaning cle	ared middle of pipe.
Dark brown black seds, Bloody lots of Fixes.	Soda were exposed
on side by about 1" There was 3" of water 11	nime+ (22-16)
Attachments	

City of Portland Environmental Services



Project Parbor	Project No.
Location	Date 5/27/15
Subject OF 77 Dry-weather Retrolum sheen Inv.	By PWH/MJS/WCRJFG
1238 - AAMO76 - Arrived on site. Stading,	water Slight Flaw groups
ipon barteria Sanitary lateral crosses throw	요 시 : 사람이 : : : M : : [하는 :] 하는 하는 하는 하는 하는 하는 하면 # ★ (하는 네트
only one spot on bottom of sanitary time. I	here is sediment in main
AM	
	ry line Not much naterial
coming off on to wipe appears to have thick materia	4. Attempted to wipe
as much as possible (22-17Wipe)	
1753 - Collected into sediment sample downstream at	- manuale 7" of solids with
1" of water about. & Seds up and downstroam	
Sortinent is mostly said and game (22-18)	
12 mg N 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
1300- Acrive et ALMO86. Sediments tourd down	• 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
13 Stayment with obvious chunky organics there is flow coming from around I terral from	A I VO LOCAL ASSOCIATION AND A CONTRACT OF A
there is the coming from adount lateral from	m south clours team of MA
1315- Collected sediment sample from clownstream	of workole Approx 7" of
sediment and 12" at water, very coarse mater	to mo smell, similar to
Just in the sed sample From AAM0710. (220)	
1322-AAMO86-Callected wipe scaple from darks	
	aple for USCG. (22-20) Upe)
The state of the s	
1327-AGMO86-Collected sample from flow on don	instream Stock of latoral
to south. Strong petroleum order a	w visible product on surface
Attachments Sull bowns 3 pots of air on surface	ce. Cond=482 (22-21)

City of Portland Environmental Services



Project_Portland Herbor	Project No.
Location OF27	Project No. Date <u>5/27/15</u>
Subject OFZZ Dry-Wenther Petioleum Sheen Inv.	By PHAMSS/WCR/JFG
	-7 -1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-
	(2012년 1월 1912년 2일 전환경기 (2012년) 1912년 - 1일
1333- Arrivact APAOIL- stanting water with a	sheen.
	N 01 N
1341 Collected Sheen up & sample of sheen on sorta appears to be fractured similar to organic sheen	er at flow for OSCG. Shorn
appears to be tractured should to organic sheek	
1345- Collected water scale from sheem on surtace, appear to be cloudy with iron bydrin Con 1 = 18	at Standing water, Somples
ropear to be cloudy with iron bidin Con 1 = 18	1 (22-26W)
<u>- [18] 사용병원 하고 이용</u> 한다는 다른 다른 사람들은 사용하는 사용하는 사용물을 다른 함께 된다고	
- No Sediment to sample in main live. Dor Smill lateral coming from NE near top of man	K Stain on wall loclow
Swill lateral coming from NID near top of wa	hole from butility & tables.
13012011 12 00 01 1 1 1 1 1 1 1	Scale A. F. Conge Kool N
1351- Collected wipe sough from bruenth latera	(27 72))[n)
	(22-234)
Attachments	



Current weather:

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Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452



Project Name: Point Code: TOP 25 Basin: Node: Address: Address:

Date and time of last known rainfall: SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT Is there water inline? Yes or No If present, water is: Flowing or Standing Depth of water = 0.25 in Rate of flow = 2 fps Hydrocarbon ☐ Brown Does river back up to this location Yes or No If river is backed up: ☐ Grey ☐ Clear Water Color □ Sanitary Water Odor ☐ Other Are sediments observed in the line? Yes or No Are recoverable quantities of sediments present in the line? Yes or No Avg Depth of seds = in Sed Depth Range = in to in to If sediments present: SITE DIAGRAM: Include street intersections/main lines/laterals/catch basins/MH's/pipe sizes/ flow direction/ driveways cuts and extent of solids accumulation as well as subsample locations. SEDS COLLECTED AT "X"S, DOWN TO 3" @ KACH COLLECTION LOCATION, FROM SAYDY SEDS IN RIPRAP WINKINGTEN OUTSIDE END OF OUTFALL SEDIME UT/SALD WATER SEAMENT/SALD

		****					- Con - Williams	
Date: (デース) -	SECTION :	2 - SAMP	LE COL	LECTION REP	ORT	Node: AAM079	Point Code: ZZ-8	
Sampling Equipme	ent: Stainless steel utensil	& stainless	steel rec	eptacle Other	(Describe)			
Equipment Decont	amination process: ber S	SOP 7.01a	□ Devi	ations (Describe)				
Sample date:			1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	(IL-XX-NNNNN ©UTKBLC	-mmyy)			
Sample location:	☐ From MH chamber ☐ Fr			ine, segment is Fr	om Node_	To N	ode	
-	technique: 12 Per SOP5.01b	□ Devia	ations (des	scribe below)				
		71 .	······································					
Visual and olfacto	- 1 Sight	or en coloration _		Color of sample		(describe) _		
				Fine Gravel Other (describe)			Debris	
If present, type of				Removed debris?	□ Yes (1	ype & Amo	unt) PNo	
Compositing notes	rer SOP5.01b □ Devi	ations (des	cribe)				•	
Sample Jars Collec	cted (number, size, full or parti	al)? /						
	le to fill all of the jars, list jars d analytes sampled (as per n work order).	Jar	Size	Amount Full		Target Ana	lyses	
							·	
.ab ID Here	·	Duplicate	e sample o	collected? (N)	1			
Duplicate sample id	lentification # on COC:	Dup ID t	tere					
	· · · · · · · · · · · · · · · · · · ·							
	35040	NI O BI	Ј ОТО6	RAPH LOG				
		4N -2: -11 54						
Overview of node showing drainage area			Filename(s):					
Plan view of sediments inline Homogenized sample (sediment in bowl)			Filename:					
							·	
Other?	Filename(s):							



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Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452



INLINE SEDIMENT SAMPLING FIELD DATA SHEET

Project Name: PORTUND H	ARBON SH	I WEATHER PETROLEUM EEU 14UESTIGATIOU	Sample ID: If collected
Sampling Team: WCIL, MJS,	Date:	Arrival Time:	Point Code: 22 - 4W 22 - 5W
Basin: -	- ***-		(481) 1 (30°)
Basin: 22	Node: AAM	<u>077</u>	Address.
Current weather:	RY ,CLOU.	ay	
Date and time of last known rainfa	5/24/15	trace	
SECTIO	N1- PRE-SA	MPLING VISUAL OBSE	RVATION REPORT
Is there water inline? Yes or No	If present, water	is:Flowing or Standing Depth	of water = in Rate of flow = fps
Does river back up to this location? Y	es or No If river is	s backed up: Water Color 🗆 🤈	Brown □ Hydrocarbon Grey Water Odor □ Sanitary Clear □ Other
Are sediments observed in the line?	Yes o No	Are recoverable quantities of sedin	nents present in the line? Yes or No
If sediments present: Avg Depth	of seds =	in Sed Depth Range =	in. to in:
Estimated dimensions of sediment de	eposit:i	n.byin. OR □ As f	far as can be seen
SITE DIAGRAM: Include street is and extent of solids accumulation with the consideration of t	as well as subsar	mple locations. GUTLET GO HAS FLOW	's/pipe sizes/ flow direction/ driveways cuts

Date: 5-27-ル SEC	CTION 2	2 - SAMPL	E COL	LECTION REP	ORT	Node: AAM 077	Point Code:	
Sampling Equipment: Stainless stee	el utensil	& stainless	steel rec	eptacle 🛘 Other (Describe)	7110	22-4W 22-5W	
Equipment Decontamination process:	□-Per S	OP 7.01a	□ Devi	ations (Describe)		··············	· ·	
Sample date: Sample time:				e (IL-XX-NNNNNN	-mmyy)			
Sample location: From MH chambe	er 🖫 Fr	om line	If from	line, segment is Fr	om Node	To N	lode	
Sample collection technique: □ Per SO	P5.01b	□ Deviat	ions (de	scribe below)		, 444 8-4		
Visual and olfactory observations:		r en <u>Ø</u> coloration		Color of sample			IGHT YELL	
Sample composition/particle size distribution (estimated percentages):		Sar osed Organ		Fine Gravel Other (describe)_		Gravel	Debris	
If present, type of debris in sample	□ Wood □ Metal □ Organ	□ Plas		Removed debris?	□ Yes (Type & Amo	unt) □ No —	
Compositing notes ☐ Per SOP5.01b	□ Devi	ations (desc	ribe)			-		
Sample Jars Collected (number, size, ful	ll or partia	al)?						
If not enough sample to fill all of the jars, collected and related analytes sampled (a analyte priority list in work order).		Jar S	lize	Amount Full		Target Ana	ilyses	
Lab ID Here		Duplicate	sample o	collected? Y/N				
Duplicate sample identification # on COC):	Dup ID He	51.6	·:				
SI	ЕСТІО	N 3 - PH	отос	RAPH LOG				
Overview of node showing drainage area	a		Filenam	e(s):	· ·	· 	· · · · · · · · · · · · · · · · · · ·	
Plan view of sediments inline			Filename:					
Homogenized sample (sediment in bowl))		Filename) :				
Other?	-		Filename	e(s):				



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Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452



INLINE SEDIMENT SAMPLING FIELD DATA SHEET

Project Name: PORTLAUD	HARROR	DRY WEI	HALL PLING-	Sample ID: 16 collected	o vs
Sampling Team: WCR M55	Dat <u>e</u> :	Arrival		Point Code:	(02 12.0)
SKG AHA, US	3 -27	12 1	029	<u> </u>	(4x,10 W)
Basin: 22	Node: AAM	080	· · · · · · · · · · · · · · · · · · ·	Address:	(431.63)
Current weather: WARY DI	Ry, SUNA	y	·		
Date and time of last known rainfa	11 '5/24'	115 trai	e		
SECTIO	N 1 - PRE-S	SAMPLING	VISUAL OBSE	RVATION REPORT	
Is there water inline? Yes or No	If present, wa	ter is: Flowing	or Standing Depth	of water = in Rate	
Does river back up to this location?	es or No If rive	r is backed up:	Water Color □	Grey Water Odor E	Hydrocarbon Sanitary Other
Are sediments observed in the line?	Yes or No	Are recoveral	ole quantities of sedir	ments present in the line?	es or No
If sediments present: Avg Depth	of seds = $\frac{2}{1}$	<u>⊘</u> in Sed D	epth Range = _ Ø . J	in, to <u>3, 0</u> in.	
Estimated dimensions of sediment de	posit: <u>/6</u>	in by UP PM	OKIN OR DE AS	far as can be seen	
SITE DIAGRAM: Include street in and extent of solids accumulation			SAMA	2-10 w mater of the collection water of the collection water of the collection of th	← \J

			- I - Company	×000/00015		marin — Marina
Date: SECTION 2	- SAMP	LE COL	LECTION REP	ORT	Node: AAM OSC	Point Code: 27-11
Sampling Equipment: ### Stainless steel utensil	& stainles:	s steel rec	eptacle Other	(Describe)		22-10W
Equipment Decontamination process:	OP 7.01a	□ Devi	ations (Describe)			**************************************
5-27-15 1/05	AAM (080 -	le (IL-XX-NNNNN - <i>ひ</i> ら			
Sample location: From MH chamber From 2 S- 00	om line CV/V/3	If from	line, segment is Fr	om Node	1 080 To No	9M 025
Sample collection technique: ☐ Per SOP5.01b	□ Devi	ations (de	scribe below)			
Visual and olfactory observations: ☐ Shee	er en coloration _					
	Sa oosed Orga		Fine Gravel <u>20</u> Other (describe)		Gravel <u></u> D	Debris
☐ Wood If present, type of debris in sample ☐ Metal ☐ Organ			Removed debris?	Ves (Type & Amoui	nt) □ No
Compositing notes Per SOP5.01b Devia	ations (des	scribe)				
Sample Jars Collected (number, size, full or partia	al)?	1 -4	02. FUL	ے د		
If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).	100 100 100 100 100 100 100 100 100 100	Size	Amount Full		Target Analy	yses
	11.					
				· ·		
Lab ID Here	Duplicat	e sample	collected? Y/N			
Duplicate sample identification # on COC:	Oup 10 h	4010				
: 						
				1.50		
SECTIO	N 3 - P	нотос	GRAPH LOG			
Overview of node showing drainage area		Filename	e(s):			-
Plan view of sediments inline		Filename:				
Homogenized sample (sediment in bowl)		Filenam	e:			
Other?		Filename	e(s):		· · · · · · · · · · · · · · · · · · ·	



CITY OF PORTLAND

ENVIRONMENTAL SERVICES

Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452



INLINE SEDIMENT SAMPLING FIELD DATA SHEET 17 22-12 Wife. ORY WERINGER PETRUKU Sample ID: SHEEL 14 VESTIGATION Point Code: Arrival Time: Current weather: Date and time of last known rainfall 115 trace SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT LOW Flowing or Is there water inline? (Yes) or No. Standing Depth of water = If present, water ist in Rate of flow = □ Brown □ Hydrocarbon ☐ Ørey ☐ Clear Water Color Water Odor Does river back up to this location? Yes or No If river is backed up: □ Sanitary □ Other Are sediments observed in the line? () or No Are recoverable quantities of sediments present in the line? Yes or No If sediments present: Avg Depth of seds = in Sed Depth Range = in. 🖦 OR 🗹 As far as can be seen Estimated dimensions of sediment deposit: in. by SITE DIAGRAM: Include street intersections/main lines/laterals/catch basins/MH's/pipe sizes/ flow direction/ driveways cuts and extent of solids accumulation as well as subsample locations. 22-15w - dry weather flow sample 22-13 Wife 22-12 wipe mineral precipitate rom scep

<i>^</i>							
Date: 5 - 27 - /5 SEC	CTION 2	2 - SAMP	LE COL	LECTION REP	ORT	12075	Point Code; 22-/4
Sampling Equipment: stainless ste	el utensil	& stainless	steel rec	eptacle Other	(Describe)		SHLLF SKIM
Equipment Decontamination process:	□ Per S	SOP 7.01a	□ Dev	iations (Describe)			
Sample date: Sample time:		Francisco (Carlos Alexandro)		de (IL-XX-NNNNN			
5-27-15 1209					- 4 <u>- 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4</u>		
Sample location: From MH chamber	er BFri	om line	If from	line, segment is F	rom Nede_	I pstream	de <u>NAMOZS</u>
Sample collection technique: Per SO	P5.01b	□ Devia	ations (de	escribe below)	<u> </u>		
		•					
Visual and olfactory observations:	□ Shee	or een coloration _		Color of sample		(describe) <u>O</u>	32-14 PAUGE-10H
Sample composition/particle size distribution (estimated percentages):	Silt/Clay Decomp	Salposed Organ	ind	Fine Gravel	Coarse G		
If present, type of debris in sample	□ Wood □ Metal □ Organ			Removed debris?	, □ Yes <u>(</u> T	Type & Amour	nt) 🗆 No
Compositing notes Per SOP5.01b	□ Devi	ations (des	cribe)				
Sample Jars Collected (number, size, fu	ill or partia	al)? /-	- 40	2			
If not enough sample to fill all of the jars,	list iars	Jar	Size	Amount Full		Target Analy	/ses
collected and related analytes sampled (a analyte priority list in work order).						Total (Comp	
		l		·		<u></u>	
							 :
	.4	<u></u>					
Lab ID Here		Duplicate	₃ sample -	collected? Y/N			
Duplicate sample identification # on COO	C:	Dup ID H	iere				
	 :						
			<u> </u>				
SI	ECTIO	N 3 - PI	HOTO	GRAPH LOG			
Overview of node showing drainage are	a		Filenam	e(s):			
Plan view of sediments inline			Filenam	e:			
Homogenized sample (sediment in bowl	1)		Filenam	e:	· .		
Other?			Filenam	, v(e).			



ENVIRONMENTAL SERVICES

Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452



Project Name: Portland Haila	- Basm & & sneen lav	Sample ID: Collected
Sampling Team: Date:	Arrival Time:	Point Code:
MJS WCR, 3FG, PHA 5/2	115 1238	22-18, 22-17 mpe
Basin: 77 Node:	AAM 076	Address:
Current weather:		
Date and time of last known rainfall: 5	124/15 trace	
	PRE-SAMPLING VISUAL OBSE	RVATION REPORT
		of water = 3 in Rate of flow = 0.5 fps
Does river back up to this location? Yes or No	If river is backed up: Water Color	Brown □ Hydrocarbon Grey Water Odor □ Sanitary
	′1	Clear Other
Are sediments observed in the line? Yes or	No Are recoverable quantities of sedir	nents present in the line? (es or No
If sediments present: Avg Depth of seds =	in Sed Depth Range =	in. toin.
Estimated dimensions of sediment deposit: _	in. byin. OR 🖬 As	far as can be seen
		's/pipe sizes/ flow direction/ driveways cuts
and extent of solids accumulation as well	as supsample locations.	
N N	22_17,	vipe (underside at samitary line)
1	lij	
	11/127-	18 sed men't sample
	TX de	
A ->		
	{ ;	
	3	

Date: 5/27/15 SECTION 2	2 - SAMPLE COL	LECTION REPO	ORT Node: Point Code:
Sampling Equipment: Stainless steel utensil	& stainless steel rec	eptacle Other (I	Describe)
Equipment Decontamination process: per S	OP 7.01a □ Devi	ations (Describe)	
Sample date: Sample time: Samp	ole Identification Cod		mmyy) Downstiem of AAMO16 om NodeTo Node
Sample location: From MH chamber From MH	om line If from	line, segment is Fro	m NodeTo Node
Sample collection technique: NPer SOP5.01b	□ Deviations (de	scribe below)	
Visual and olfactory observations: □ She	renenenenenenenenenenen en e		☐ Brown ☐ Grey ☐ Other (describe)
	Sand <u>50</u> osed Organics	Fine Gravel 35 Other (describe)	Coarse Gravel 25_ Debris
□ Wood If present, type of debris in sample □ Metal □ Organ		Removed debris?	Yes (Type & Amount) No
Compositing notes ☐ Per SOP5.01b ☐ Devia	ations (describe)		
Sample Jars Collected (number, size, full or partia	al)?		
If not enough sample to fill all of the jars, list jars	Jar Size	Amount Full	Target Analyses
collected and related analytes sampled (as per analyte priority list in work order).	402	Fall	
Lab ID Here (1)	Duplicate sample of	collected? Y/N	
Duplicate sample identification # on COC:	Dup ID Here		·
SECTIO	N 3 - PHOTOG	RAPH LOG	
Overview of node showing drainage area	Filenamo	e(s):	
Plan view of sediments inline	Filenam	→ :	
Homogenized sample (sediment in bowl)	Filename	<u> </u>	
		•	



ENVIRONMENTAL SERVICES

Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452



Project Name: Portland H	arbor - OF	27 sheen Inv.	Sample ID: If collected	3
Sampling Team:	Dațe:	Arrival Time:	Point Code:	
MJS, WLR, JFG, PHA	5/27/15	1300		1 20 m. ye
Basin: 77	Node: AAM	086	Address: aa_alw	
Current weather:				
Date and time of last known rainfa	11:5/24/15:H	race	A	
SECTION	N1- PRE-SAM	PLING VISUAL OBSEI	RVATION REPORT	
Is there water inline? Yes or No	If present, water is	Flowing pr Standing Depth	of water = <u>7.5</u> in Rat	
Does river back up to this location? Y	es on If river is ba	cked up: Water Color 🗆 🛭	Brown Grey Water Odor Clear	☑ Hydrocarbon ☐ Sanitary ☐ Other
Are sediments observed in the line?	Yes or No Are	recoverable quantities of sedin	nents present in the line?	(es) or No
If sediments present: Avg Depth		Sed Depth Range =	/in. toin.	
Estimated dimensions of sediment de	eposit: 4 13 in. b	yin. OR 🗷 Ast	far as can be seen	
SITE DIAGRAM: Include street in and extent of solids accumulation			's/pipe sizes/ flow direct	ion/ driveways cuts
		N1		·
	×		12 19	
			10001	
			, 	
	1		c.l.	
		22.20 /	7 / 22.	21 W
		•		
	•			
			South lateral	

Date: 5/97/15 SECTION 2	2 - SAMPI	LE COL	LECTION REP	ORT	Node: AAM 086	Point (6 fuz.
Sampling Equipment: Stainless steel utensil	& stainless	steel rec	eptacle Other	(Describe)			gowije alw
Equipment Decontamination process: Ber S	OP 7.01a	□ Dev	ations (Describe)				
Sample date: Sample time: Samp	ole Identifica		e (IL-XX-NNNNN				
Sample location: □ From MH chamber □ From	om line	If from	line, segment is Fr	om Node	TON)86 ode	
Sample collection technique: Per SOP5.01b	□ Devia	tions (de	scribe below)			· · · · · · · · · · · · · · · · · · ·	
Visual and olfactory observations: □ She	r <u>pervol</u> en _ coloration _		Color of sample		n (describe)		
Sample composition/particle size Silt/Clay distribution (estimated percentages): Decomp	Sar osed Orgar	nd <u>}5</u> nics	Fine Gravel <u>50</u> Other (describe)	Coarse (Gravel <u>25</u> [Debris	
☐ Wood If present, type of debris in sample ☐ Metal ☐ Organ			Removed debris?	Yes (Type & Amou	int) <u>r</u> ei	ı No
Compositing notes ☐ Per SOP5.01b ☐ Devi	ations (desc	cribe)					
Sample Jars Collected (number, size, full or partia	al)?						
If not enough sample to fill all of the jars, list jars	Jar S	Size	Amount Full		Target Anal	yses	
collected and related analytes sampled (as per analyte priority list in work order).	40	7	- Full		· · · · · · · · · · · · · · · · · · ·		
							
	-	·					
Lab iD Here	Duplicate	sample	collected? Y/N		<u> </u>		
Duplicate sample identification # on COC:	Dup ID H	era					
SECTIO	N 3 - PF	ЮТОС	RAPH LOG	<u></u>			
Overview of node showing drainage area		Filenam	e(s):				
Plan view of sediments inline		Filenam	э:				
Homogenized sample (sediment in bowl)		Filenam	e:				
Other?		Filenam	e(s):	··		,	



Date: <u>5/27/15</u>

Work Order #: WS\$794

Collected By: MJS, WCR, JFG, PHA

Client Name:	Director's Office		`		•			
Project Name:	Portland Harbor			• .			•	

<u></u>				•	·			_			Ŕ	teq	ues	ted	Ar	aly	ses	3	-				-	
Number	Special Instructions: Basin 22 Petroleum Si Run NWTPH-Dx and			i i		tciD'	w-Level)														Conductivity (unhos/cm)	Ý.	☐ Standard	I-Time Request (10 business days) usiness days)
Lab Nu	Location ID	Sample Date	Sample Time	Grab or Comp	Sample Matrix	NWTPH-HCID	PAHs (low-Level)														Conduct	Meter: (# of Containers	Remarks
01	22_8	5/27/2015	0929	С	Sed	•				·													1	AAM079 (OF22) Sediment Composite
۵	22_8W	5/27/2015	0930	G	Water	•	•														30	29	2	AAM079 (OF22) Dry-weather Flow
3	22_9W	5/27/2015	1004	G	Water	•	•	<u> </u>			,								•				2	AAM077-E 60" Dry-weather Flow
4	22_4W	5/27/2015	1009	G	Water	•	•			<u> </u>										<u> </u>			2	AAM077-W 48" Dry-weather Flow
5	22_5W	5/27/2015	1013	G	Water	•	•																2	AAM077-SW 30" Dry-weather Flow
6	22_10W	5/27/2015	1049	G.	Water	•	•											-			37	2	2	AAM080 Surface Sheen
Ø	FDBLANK	5/27/2015	1121	G	Water	•	•													<u> </u>			2	Field Decon Blank of Bowl and Bailer
8	22_11	5/27/2015	1105	G out	Sed	•		<u> </u> .															1	AAM080-SW Inline Sediment
9	22_12Wipe	5/27/2015	1140	G	Wipe	•							·										1	AAM075-S Wipe under lateral
10	22_13Wipe	5/27/2015	1147	G	Wipe	•										ed By				<u> </u>			1 Ived By:	AAM075-N Wipe from end of pipe

Relinguished By:	Received By:	. <u>Retinqu</u>	shed By:	Received By:	
Stanstures 11 11 11	Dete: / Signature:	Date: Signature:	Dafe:	Signature:	Date:
Mutt tall	5/27/13: 1-1	124/15			
Printed Name:	Time: Printed Name:	Times Printed Ka	ne: Time:	Printed Name:	Time:
Matt Sallivan	1551 Weentok re	A KSI I	•		

Portland Harbor - Basin 22 Petroleum Sheen COC #1 (5-27-15)



Date: 5/27/15

Work Order #: WSE 194

Collected By: MTS, WCR, JEG, PHA

Client Name: Director's Office

Project Name: Portland Harbor

				, 11								R	ear	ies	ad	Δn	alv	/604			·			·	
1.	Special Instructions: Basin 22 Petroleum Sh Run NWTPH-Dx and i	•		r		HCID1	PAHs (low-Level)						cy	463	leu		ally	36	3			Conductivity (umhos/cm)	OM DO	□ Standard (I-Time Request: (10 business days) usiness days)
Lab Number	Location ID	Sample Date	Sample Time	Grab or Comp	Sample Matrix	NWTPH-HCJD	PAHS (K				٠				,					-		Conduct	Meter:	# of Containers	Remarks
\$1	22_14Wipe	5/27/2015	1153	G	Wipe	•																		. (AAM075-Shelf Wipe from Shelf
12	22_15W	5/27/2015	1159	G_	Water	•	•					انستا										324	1	2	AAM075 - DS Dry-weather Flow
l3	22_13W	5/27/2015	1201	G	Water	•	•		,													670	7	2	AAM075-N Dry-weather Flow
14	22_14	5/27/2015	1209	J io	Sed	•																		1	AAM075-Shelf Inline Sediment
15	22_16	5/27/2015	1212	Q D	Sed	•																		1	AAM075-US Inline Sediment
16	22_17Wipe	5/27/2015	1249	930 G	Wipe	•			-															1	AAM076-Sanitary Line Wipe from bottom
17	22_18	5/27/2015	1253	C	Sed	•														•				1	AAM076-DS Inline Sediment
18	22_19	5/27/2015	1315	C	Sed	•																		1	AAM086-DS Inline Sediment
19	22_20Wipe	5/27/2015	1322	G	Wipe	•													-					l	AAM086-S Wipe on US side of Lat
20	22_21W	5/27/2015	1327	G_	Water	•	•															48	2	2	AAM086-S Flow on DS side of Lat
	Relinquished By: Signature:	Plan	Date:	/27/ <i>1</i> 5	Received By Signature	<i>E</i>	<i>></i>		_		ç	Date:	ıs	-	eling: grature		d By	<u>"</u>			Date:	- 1-	eceir gnatur	red By:	Date:
	Printed Name: Matt Su	llivan	Time:	51.	Printed Name:	(عدا	h	50 ₃ ,	م جر	1		Time:		P	rinted N	ame:					Time:	PH	inted	ieme:	Time:



Date: 5/27/15

Work Order #: WSE 194

Collected By: MJS, WCR, JFG, PHA

Client Name:	Director's Office	
Project Name:	Portland Harbor	

				•	·				<u>.</u>		R	eq.	ues	tec	l Ai	nal	yse	S				.:
	Special Instructions: Basin 22 Petroleum Si Run NWTPH-Dx and			I		iciD1	v-Level)									.			-	Conductivity (umhos/cm)	Standa	nd-Time Request: rd (10 business days) 5 business days)
Lab Number	Location iD	Sample Date	Sample Time	<u>G</u> rab or <u>C</u> omp	Sample Matrix	NWTPH-HCID	PAHs (low-Level)				 									Conduction Conduction	G Onlei.	
3 .1	22_22W	5/27/2015	1345	G	Water	•	•.											 		187) a	APA016 Surface Sheen
22	22_23Wipe	5/27/2015	1351	G	Wipe	•															1	APA016 Wipe under lat from NE
				_																		
1																						
								<u> </u>														
	Relinquished By: Signature: My Ba	Min	Date:		Received B	2 2		<i>بر</i>		S	Date:	115	1	Relin Signati	quist	ed.B	Y:		Date:		ceived By:	Oata:
	Printed Name: Matt Salla	1610	Time:	•	Printed Name:		rst	24	7		Time:	}		Printed	Name	-		-	Time:	Prin	ted Hame:	Time:

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Attachments

DAILY FIELD REPORT





of Page Project Project No. OFZZ Location Date_ BY PHAMUS/WCR/ECL Subject OFZZ Dry QBB brown town Jozn en sustace in an Booky is haying from rung in QBM water sample from surface within a collect sample leaving wer wipe sample from wipe sample from durk stack ve be greasy degraded undered

DAILY FIELD REPORT





Project Portland Harber Project No.
5 F 77 - 6/20/15
Subject OF22 Project for Petatron Shern Tur By PH MUS/WOR FECH
1043. Collected dry-weather Flow serple from 12" lateral Lo gov the Novisible 22.27W) Spean, slight petroleon over. Cond = 103
1050, AAP794 Collected sintine sedient sople from just downstream of methode. 22-28) Novisible steen, no odor
1056 AAP794-Collected dry-weather thousandle from upstream of makele 122-290/Slight yellow who, no odor. Cond = 184 w/
1104 ANV153- Irange Flow ording Howsh make to Book staining on shalf on a st Side of make. Obvious To I all iran barteria an shelf on west-side of membre, Pershed leteral to east with orange meteral on shall below cottet. Sull amount of It I above julet line Main inlet is 12" from SF. Ootlet is also 12".
Ullo-ANV453 - Collected wipe souple from orange untered below perched 22.30 wiplateral From cast.
1119-ANV453-Collected wipe sample from shelf on east side with 22.31 wipe dark stain.
1128-AHP793- Smill around of flow, no orange iron bacteria. It Enterry unhale on shelf to west. Appears to be clear water in smill amount, Flow appears to Start Backing up 5ft. downston of make
Attachments

DAILY FIELD REPORT





Page _____3___ of ____3___

Project Post Hand flasher Project No.
Location 0F27 Date 5/28/15
Subject OFZZ Dry-monther Potos from Sheen Inv. By PHH/MJS/WOR ECH
1/41-AAR792-Arrived at wearbole Smill amount of flow coming
from lateral to south, lateral in 12" Main intet 27" and of let is
141-AAR792-Arrived at member Smillamount of flow roming from lateral to soother Lateral in 12" Main intet 27" and outlet is 27" also. north
IN19Z
1148- Collected dry weather flow sample from lateral, Approx O. Igpu of Flow.
1148-Collected dry weather flow sough From lateral Approx O.lgpm of this. [22-32W) Shi collection due to low Flow. Cond = 173, Clever water, no order
▲ THE TOTAL CONTROL OF THE SECOND TO THE SECOND SECOND TO THE SECOND S
1200-AAP791-Arrived at membroke small amount of flow. It I entering mulable ancitles side of incomin pipe, It I is minor and appears to be elect. Then appears to be sample able solds upstream of make.
mulate ancitle sick of incoming paper IAI, s minural appears to
be elect. Then appears to be souple able sieleds upstream of makel
[209: AAP79] - Collected by weather flow sengle from within muhola [22-33W) Covil = 194
(2Z-CW) COM1-199
69 34) C LL AG SILL AG
1716-AAP791-Collegated day agreated in the sediment from upstream (22-34) of mentole Aug Sed depthis 0.5". No sherror orlors.
1345-AAM078- Acrived at site begin setting ptraffic control
Sull anount of flow no orange color no odor Elidone of
T&I contected just below collar of manhole Sodinent in line
but eache and dock.
7 1908-Alte 1078 - Collected in line sediment sough from upstran, approx 2°
of manhole. No door or shren.
+ 1412 - AAMO78-Collected de wipe sample from wetterd over at collect
mantiple
¹ Attachments



CITY OF PORTLAND ENVIRONMENTAL SERVICES Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452



Project Name: Portland Harbo	n Sample ID: If c	OUZIZ ZHW		
Sampling Team: MJS, ECH, WCR, PHA, +	Date: 5/28/15	Arrival Time:	Point Code:	72-25 wis
Basin: 22	Node:	059 (lateral m	Address:	72-26w-7
Current weather: Sunny, 60s in	n morning – 80s in a	afternoon)	2
Date and time of last known rai	nfall: ~1/4" on 5/11/15	5, ~1/10" on 5/12/15		

	SECTION	11 - PRE-	SAMPLING	VISUAL OB	SERVATIO	N REPORT	
Is there water inline?	Yes or No	If present, wa	ater is: Flowing	or Standing D	epth of water = _	1/2 in Rat	te of flow = (fps
Does river back up to	this location? Yes	s or No If rive	er is backed up:	Water Color	☐ Brown ☐ Grey ☐ Clear	Water Odor	☐ Hydrocarbon ☐ Sanitary ☐ Other
Are sediments observe	ed in the line? Y	es or No	Are recovera	ble quantities of	sediments prese	ent in the line?	Yes or No
If sediments present:	Avg Depth of	seds =	in Sed D	Depth Range =	in. to	in.	н ,4
Estimated dimensions	of sediment depo	osit:	in. by	in. OR 🛘	As far as can b	e seen	in the second
SITE DIAGRAM: In and extent of solids					/MH's/pipe siz	es/ flow direct	tion/ driveways cuts
The same of the sa	location		20.20 2		1013	vater sum Wipe from	ple 22-241
16"					1021	injet 8	ple 12-241 m above intet 25-25-wipe 2-26-wipe
	6	1840 1		i e			
	A1	59			10"		
		¥ #			1	v e eg	
7		\$. T		()		1 ()	
Cir		2 2	b	som hangi lackings	ue in out	let but	not

Date: 5/28/15 SECTION 2	- SAMF	'LE COL	LECTION REP	ORT Node: Point Code:
Sampling Equipment: Stainless steel utensil	& stainles	s steel rec	eptacle Other	(Describe)
Equipment Decontamination process: □ Per Se	OP 7.01a	□ Devi	iations (Describe)	
Sample date Sample time: Sample 5 28 15 013 (water) Sample	le Identific	ation Cod	e (IL-XX-NNNNN	l-mmyy).
Sample location: ☐ From MH chamber ☐ Fro	om line	If from	line, segment is Fr	rom NodeTo Node
Sample collection technique: ☐ Per SOP5.01b	□ Devi	ations (de	scribe below)	
1	8		*	
Visual and olfactory observations:	r <u> Cafu</u> en <u> S</u> oloration _	<u></u>	Color of sample	□ Brown □ Grey □ Other (describe)
	Sa osed Orga		Fine GravelOther (describe)_	Coarse Gravel Debris
☐ Wood If present, type of debris in sample ☐ Metal ☐ Organ	□ Pla		Removed debris?	☐ Yes (Type & Amount) ☐ No
Compositing notes ☐ Per SOP5.01b ☐ Devia	itions (des	cribe)	25 25	19 E
Sample Jars Collected (number, size, full or partia	I)? :	}		aubirs, for (Ene)
If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per	Jar	Size	Amount Full	Target Analyses
analyte priority list in work order).				
		en a sagar agr	AN THE SECOND STATE OF THE SECOND SEC	
Lab ID Here	Dunlicat	eample (collected? Y/N	44 7 7 1
Duplicate sample identification # on COC:	Dup ID H		Ollected	
	Jan will			
	0 15 55			***************************************
SECTION	[3 - PF	OTOG	RAPH LOG	
Overview of node showing drainage area	1	Filename((s):	
Plan view of sediments inline		Filename:	4	
Homogenized sample (sediment in bowl)		Filename:	* **	
Other?		Filename	(a):	



CITY OF PORTLAND ENVIRONMENTAL SERVICES

Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452



Project Name: Portland Harbor – Basin 22 Dry Weather Sheen Investigation Sampling Team: MJS, ECH, WCR, PHA, + Basin: 22 Node: MP 700 Current weather: Sunny, 60s in morning – 80s in afternoon Date and time of last known rainfall: ~1/4" on 5/11/15, ~1/10" on 5/12/15

	SECTION	11 - PRE-SA	MPLING VIS	UAL OBSERV	Anertie alle antender alle alle antende de la company	Т
Is there water Inline?	Yes or No	If present, water	is: Flowing or S	tanding Depth of w	ater = 10 in F	Rate of flow =
Does river back up to	this location? Yes	of No If river is	backed up: W	☐ Brow ater Color ☐ Grey ☐ Clea	Water Odo	☐ Hydrocarbon r ☐ Sanitary ☐ Other
Are sediments observ	ed in the line? /Y	es or No	Are recoverable q	uantities of sediment		? (Yes) or No
If sediments present:	Avg Depth of	seds = 3	_in Sed Depth	Range = Cova	in toin	1.3 in
Estimated dimensions	of sediment der	sit:	i. by 24 uni	OR DE Astara	s can be seen	
SITE DIAGRAM: In and extent of solids	nclude street inte		lines/laterals/ca		pe sizes/ flow dire	ection/ driveways
N LEAR N L		1 Q	150	1043	water sun lateral 2	Me freu
* Sodiment		7		1050	Sedimer From	it san p
in pipe	(1	XX	absorbages	water to	tens fr
-	AAP		X	12" Pipe ec		2-29%
-a+-	70M		(ECH)	7	H.	
		B.		drawn-ouc vole)	PPoste	*
	j un	· . /			30 beams	le .
3/2				N/A	location	ng
	X 1.1-21	* 5.5	S 20 20	100	D 0	40 47

Y Y			*					
Date: 5 74/15 SECTION 2 -	SAMI	PLE COL	LECTION	REPO	DRT	Node:	Point C	Code:
Sampling Equipment: Stainless steel utensil & s	stainles	s steel rec	eptacle 🗆	Other (f	Describe)			
Equipment Decontamination process: Per SOF	⊃ 7.01a	□ Devi	iations (Desc	ribe)				
Sample date: Sample time: Sample	Identifi	cation Cod	e (IL-XX-NNI	NNNN- 28	mmyy)			
Sample location: From MH chamber From Sample collection technique: Per SOP5.01b	line	If from	line, segmen	_1		To I		
	\/\luncerrel{\lambda}\/\luncerrel{\luncerrel}\/\luncerrel{\luncerrel}\/\luncerrel}	Hight	Color of s	ample		(describe)	п	
Sample composition/particle size distribution (estimated percentages): Silt/Clay Composed								
If present, type of debris in sample of Metal organics	□ Pla		Removed de Waa UKS IMV	ebris?	Yes (T	ype & Amo	unt)	i No
Compositing notes Per SOP5.01b □ Deviation	ons (de	scribe)						
Sample Jars Collected (number, size, full or partial)?			4 12		v			
If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).	Jar	Size	Amount F			Target Ana	alyses	
		N (5 (62)	* *			8 88 3	15	
Lab ID Here	Ouplicat	e sample o	collected? Y	(CN)				
Duplicate sample identification # on COC:	Oup ID H	Here			N 00500			1
	Marie Parent					is a second seco		
SECTION	3 = P}	HOTOG	RAPH LO	ЭG				
Overview of node showing drainage area		Filename	(s):				-	
Plan view of sediments inline		Filename	:		113.46 500	ē		
Homogenized sample (sediment in bowl)		Filename	<u> </u>			(# <u>)</u> *	8	×
Other?	-	Filename(s):						



ENVIRONMENTAL SERVICES

Water Pollution Control Laboratory 6543 N. Burlington Ave., Fortland, OR 97203-5452



Project Name: Portland Harbor -- Basin 22 Dry Weather Sheen Investigation Sampling Team: MJS, ECH, WCR, PHA, + Project Name: Portland Harbor -- Basin 22 Dry Weather Sheen Investigation Sampling Team: MJS, ECH, WCR, PHA, + Point Code: Project Name: Project Name

Basin: 22 Node: All 452 Address:

ANV 477

Current weather: Sunny, 60s in morning – 80s in afternoon

Date and time of last known rainfall: ~¼" on 5/11/15, ~1/10" on 5/12/15

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT
Is there water inline? Yes or No. If present, water is: Flowing or Standing Depth of water = in Rate of flow = fps
Does river back up to this location? Yes or No If river is backed up: Water Color
Are sediments observed in the line? Yes or No Are recoverable quantities of sediments present in the line? Yes or No
If sediments present: Avg Depth of seds = in Sed Depth Range = in. to in.
Estimated dimensions of sediment deposit: in. by in. OR 🛘 As far as can be seen
SITE DIAGRAM: Include street intersections/main lines/laterals/catch basins/MH's/pipe sizes/ flow direction/ driveways cuts and extent of solids accumulation as well as subsample locations.
the about 3 vp line, pipe takes a bend towards Thilips 66 property
Philips 66 property
1 116 wipe from below 6" lateral and chamber seam-orange color
12" Tall - ANV 1119 wipe from chauten fleor scap-dark
453 22-31 wipe
appears mineralinature,
dry vnablete war
[10]

Date: SEC	CTION 2	! - SAMP!	LE COL	LECTION REP	ORT No	de: Point Code:
Sampling Equipment: □ Stainless stee	el utensil	& stainless	steel reco	eptacle Other	(Describe)	
Equipment Decontamination process:	□ Per S	OP 7.01a	□ Devi	ations (Describe)		
Sample date: Sample time:	Samp	ile Identifica	ation Code	e (IL-XX-NNNNNN	Emmyy)	
Sample location: From MH chambe	r 🗆 Fro	om line	If from	line, segment is Fr	om Node	To Node
Sample collection technique: □ Per SOI	P5.01b	□ Devia	itions (des	scribe below)	es met, d.	e enge
	및 경기		30			
Visual and olfactory observations:	□ Shee	reneoloration		Color of sample	☐ Brown ☐ Grey ☐ Other (des	scribe)
		Sar		Fine GravelOther (describe)_		rel Debris
If present, type of debris in sample	□ Wood □ Metal □ Organi		이 시장성 원이	Removed debris?	, □ Yes (Type	e & Amount) □ No
Compositing notes Per SOP5.01b	□ Devia	ations (desc	cribe)		I DELEGIE	d.
Sample Jars Collected (number, size, full	or partia	il)?				
If not enough sample to fill all of the jars, I		Jar S	Size	Amount Full	Tar	get Analyses
collected and related analytes sampled (a analyte priority list in work order).	s per		2)			
				8	2	
the second of th		D _{j2}	THE O NII	1 Table 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2. 1 2. 1 2. 1 2. 1 2. 1 2. 1 2. 1 2. 1	Mar 7 8 an M
Lab ID Here		Duplicate	sample c	collected? Y/N		
Duplicate sample identification # on COC	•	Dup ID He			3.000	12
	-		***			
SE	CTION	13-PH	отос	RAPH LOG		
Overview of node showing drainage area	200		Filename((s):	192	Characteristics and Charac
Plan view of sediments inline		ſ	Filename:		1 2	
Homogenized sample (sediment in bowl)	4	ı	Filename:	ğ E		
Other?			Filename((e)·		



ENVIRONMENTAL SERVICES
Water Pollution Control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452



Project Name: Portland Harbo	Sample ID: If all ged		
Sampling Team: MJS, ECH, WCR, PHA, +	Date: 5/28/15	Arrival Time:	Point Code:
Basin: 22	Node: AAP	792	Address:
Current weather: Sunny, 60s in	n morning – 80s in a	ofternoon	
Date and time of last known rain	nfall: ~¼" on 5/11/15	, ~1/10" on 5/12/15	3

SECTIO	N 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT
Is there water inline? Yes or No	If present, water is: Flowing or Standing Depth of water = in Rate of flow = fps
Does river back up to this location? Y	es of No If river is backed up: Water Color
Are sediments observed in the line?	Yes or No Are recoverable quantities of sediments present in the line? Yes or No
If sediments present: Avg Depth of	of seds = in
Estimated dimensions of sediment de	posit: in. by in. OR □ As far as can be seen
SITE DIAGRAM: Include street in and extent of solids accumulation	ntersections/main lines/laterals/catch basins/MH's/pipe sizes/ flow direction/ driveways cuts as well as subsample locations.
XN	1148 sample force - 1000 busellow from 12" Internit 22 32.
	busellow from 12"
	Internit 22-32w
trace	
r O. 1 spor	AAP TI
IN! T	T912 - 10127"
1 1 1	
near falut	
and further down the line	
but appears / 40	
biological L	

	The second secon	-			
Date: SECT	TION 2 - SAM	IPLE COL	LECTION REP	ORT Node:	Point Code:
Sampling Equipment: Stainless steel	utensil & stainle	ss steel rec	eptacle Other	(Describe)	
Equipment Decontamination process:	Per SOP 7.01a	a 🗆 Devi	ations (Describe)	5)	.*1
Sample date: Sample time:	Sample Identif	fication Cod	e (IL-XX-NNNNN	-mmyy)	
Sample location: From MH chamber	☐ From line	If from	line, segment is Fr	om NodeT	o Node
Sample collection technique: Per SOPs	5.01b □ De	viations (des	scribe below)		
Visual and olfactory observations:	Sheen			☐ Brown ☐ Grey ☐ Other (describe	e)
	ilt/Clay S ecomposed Org		Fine GravelOther (describe)_	Coarse Gravel	Debris
If present, type of debris in sample	ı Metal □ P	arge rocks Plastic Paper	Removed debris?	□ Yes (Type & Ar	mount) 🗆 No
Compositing notes Per SOP5.01b	□ Deviations (de	escribe)	57942758633475	Const.	** ************************************
Sample Jars Collected (number, size, full o	or partial)?				
If not enough sample to fill all of the jars, list collected and related analytes sampled (as analyte priority list in work order).	t jais	ar Size	Amount Full	Target A	nalyses
	4 2		P - 12 E		
	*		5.	2000 et 10	
Lab ID Here	Duplica	ate sample c	collected? Y/N		
Duplicate sample identification # on COC:	Dup ID	Here		1127	
	e ji		e .		
0-4					
SEC.	TION 3 - F	HOTOG	RAPH LOG		
Overview of node showing drainage area		Filename((s):		
Plan view of sediments inline		Filename:		N	
Homogenized sample (sediment in bowl)		Filename:	ñ L	THE WE	
Other?	Filename(s):				



ENVIRONMENTAL SERVICES Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452



INLINE SEDIMENT SAMPLING FIELD DATA SHEET Project Name: Portland Harbor - Basin 22 Dry Weather Sheen Investigation Sample ID: If the Sampling Team: MJS, ECH, Date: 5/28/15 Arrival Time: Point Code: WCR, PHA, + Basin: 22 Node: Address:

Current weather: Sunny, 60s in morning – 80s in afternoon
Date and time of last known rainfall: ~¼" on 5/11/15, ~1/10" on 5/12/15
SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT
Is there water inline? Yes or No If present, water is: Flowing or Standing Depth of water = 0.5 in Rate of flow = 1.5 fps
Does river back up to this location? Yes of No If river is backed up: Water Color
Are sediments observed in the line? Yes or No Are recoverable quantities of sediments present in the line? Yes or No
If sediments present: Avg Depth of seds = 12 in Sed Depth Range = 4 in. ta in. ta
Estimated dimensions of sediment deposit: 10 in. by 30 in. OR I As far as can be seen
SITE DIAGRAM: Include street intersections/main lines/laterals/catch basins/MH's/pipe sizes/ flow direction/ driveways cuts and extent of solids accumulation as well as subsample locations.
Man Nole is surround by grave I-not asphal
1209 Water sample
T - 100
21 791 121Ce 3edium sumpl
72-

2 9 2 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2			7 1 2 2 2		The state of the s
Date: 5 28 15 SECTION 2 - S	SAMP	LE COL	LECTION	REPO	ORT Node: Point Code;
Sampling Equipment: Stainless steel utensil & st	ainless	steel rec	eptacle	Other (I	Describe)
Equipment Decontamination process: Per SOP	7.01a	□ Devi	iations (Desci	ribe)	
Sample date: Sample time: Sample ld	dentific	ation Cod	e (IL-XX-NN)	אואואול-	mmyy) 22-33
Sample location: From MH chamber From I	ine	If from	line, segmen	nt is Fro	m NodeTo Node
Sample collection technique: Per SOP5.01b Caaval Wave and wo Visual and olfactory observations: Discolore	na l	te	Q Color of s	(e3	Vemoved prier Brown to Composi Grey Other (describe)
Sample composition/particle size distribution (estimated percentages): Silt/Clay Composed			Fine Gravel _ Other (desc		Coarse Gravel 38 Debris 8
If present, type of debris in sample ☐ Wood ☐ Metal ☐ Organics	□ Plas		Removed de	ebris?	☐ Yes (Type & Amount)
Compositing notes Per SOP5.01b Deviation	s (des	cribe)			
Sample Jars Collected (number, size, full or partial)?	THE RESERVE	(1)	404	. 4	
If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).	Jar	Size	Amount F	all	Target Analyses
			2 1.4		
Lab ID Here Du	plicate	sample o	collected? Y	N)	
Duplicate sample identification # on COC:	p ID H	ere			31 Sec. 1991
	81				
				A STATE OF THE STATE OF	
SECTION 3	- PH	OTOG	RAPHILO)G	
Overview of node showing drainage area		Filename	(s):		AND
Plan view of sediments inline		Filename			
Homogenized sample (sediment in bowl)	1	Filename			
Other?	j	Filename	(s):		V



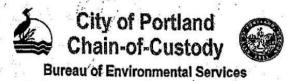
ENVIRONMENTAL SERVICES Water Poliution Control Laboratory 6543 N: Burlington Ave., Portland, OR 97203-5452



A particular control of the IN-IN	ESEDIMEN	I SAMALING HELDE	ANA OHIEE	4650
Project Name: Portland Harbor	– Basin 22 Dry V	Veather Sheen Investigation	Sample ID:	950
Sampling Team: MJS, ECH, WCR, PHA, +	Date: 5/28/15	Arrival Time:	Point Code:	Living
Basin: 22	Node:	M 078	Address:	22.35
Current weather: Sunny, 60s in	morning – 80s ir	afternoon		
Date and time of last known rainf	all: ~1/4" on 5/11/	15, ~1/10" on 5/12/15		
SECTION	DN1- PRE-S	AMPLING VISUAL OBSE	RVATION REPORT	
Is there water inline? Yes or No	If present, water	er is: Flowing or Standing Depth	of water = <u> </u>	'e'
Does river back up to this location?	res or No If hiver	is backed up: Water Color	Brown Grey Water Odor Clear	☐ Hydrocarbon☐ Sanitary☐ Other
Are sediments observed in the line?	Yes or No	Are recoverable quantities of sedir	nents present in the line?	Yes or No
If sediments present: Avg Depth	of seds =3	in Sed Depth Range =	in. to3in.	0 4:
Estimated dimensions of sediment de	eposit: 16	in. byin. OR 💆 As	far as can be seen	
SITE DIAGRAM: Include street and extent of solids accumulation		was arrest and a state of the same and a state of the same and		1
	40		108 sumple	29 3/6
	1	Ill wipe. 1	412 wiped	1+122
	i, !	100007124		92.76
		pipes fri	1+5	22.35
	<i>a</i>	1117		
<i> </i>	HAM.	- /~2'	, to	
	078	H	T	
		() EE (301	
			, T	
		XXX 3cd	subsample	3
	2		1	*x

Date: 5 28 15 SECTION 2 - SAM	MPLE COLLECTION REPORT Node: Point Code:
Sampling Equipment: Stainless steel utensil & stainle	ess steel receptacle
Equipment Decontamination process: Deer SOP 7.01	a □ Deviations (Describe)
Sample date: Sample time: Sample Ident	fication Code (IL-XX-NNNNNN-mmyx)
Sample location: A From MH chamber of From line	If from line, segment is From NodeTo Node
The second secon	eviations (describe below)
Visual and olfactory observations: Odor Sheen Discoloration	Color of sample Di Grey Other (describe)
Sample composition/particle size distribution (estimated percentages): Silt/Clay	Sand 80 Fine Gravel 0 Coarse Gravel 5 Debris 2 ganics Other (describe)
	Removed debris? Yes (Type & Amount) No Paper Unall to Venaue escribe)
Compositing notes Per SOP5.01b Deviations (d	escribe) too small
Sample Jars Collected (number, size, full or partial)?	(1) 4 02 Javs
If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).	ar Size Amount Full Target Analyses
Lab ID Here Duplic	ate sample collected? Y(N)
Duplicate sample identification # on COC: Dup ID	Here
SECTION 3 - F	HOTOGRAPH LOG
Overview of node showing drainage area	Filename(s):
Plan view of sediments inline	Filename:
Homogenized sample (sediment in bowl)	Filename:
Other?	Filename(s):

Portland Harbor - Basin 22 Petroleum Sheen COC #1 (5-28-15)



Date: 5/28/15

Work Order #: WISE199

Collected By: MJS, WCR, ELH, PHA

Client Name:	Director's Office	8			 ~ ~~~	- 34	 - 17 E	 	
Project Name:	Portland Harbor		1 1,	. Sac	2 2			+	

		1			-	•					- 1	Req	uest	ed A	\na	yse	S				/*	
Lab Number	Special Instructions: Basin 22 Petroleum 5 1 Run NWTPH-Dx and	NWTPH-Gx	if detected	Grab or.	Sample	NWTPH-HCID1	PAH (low-Level)													Conductivity (unhos/cm) Meter: Combo	Standard Rush (5 to Other:	f-Time Request: (10 business days) usiness days)
3	Location ID	-Date	Time	<u>C</u> omp	Matrix	Ž	PA		+	-	-	-	700	+	+				-		Containers	Remarks 23 059 ABQ059 -
1	22_24W	5/28/2015	1013	G	Water	•	•				-									254	2 ^	Surface Sheen Water
i	22_25Wipe	5/28/2015	1018	G	Wipe	•															1	8059 ABQ059 Wipe above 16" inle
3	22_26Wipe	5/28/2015	1021	G.	Wipe	•															1 46	8059 ABQ 059 Wipe below 6" inlet
	22_27W	5/28/2015	1043	G G	Water	•	•													103	2	AAP794 Dry Flow from 12" La
S. S	22_28	5/28/2015	1050	Comon Una	Sed	•															1	AAP794 Inline Sediment DS
,	22_29W	5/28/2015	1056	G	Water	•	•					0 111				-				184	2	AAP794 Dry Flow from US
	22_30Wipe	5/28/2015	1116	G .	Wipe	•	2				4		0)					+C			1	ANV453 Wipe under east La
,	22_31Wipe	5/28/2015	1119	G	Wipe	•										Ċ		-			1	ANV543 Wipe from east she
1	22_32W	5/28/2015	. 1148	G	Water	•	•													173	2	AAP792 N Dry Flow from S La
)	22_33W	5/28/2015	1209	G	Water	•	•													194	2	AAP791 Dry Flow
	Relinquished By: Signature: Mach	11/2	Date	18/14	Received B	Y	1/	1			Date	28-1	S	elingul gnature:	shed	Ву:	. 7	- N	Date:	Rec Signa	eived By: ture:	Date:
	Printed Name: Matt Sulliva	9	101101	515	Printed Name:	holi	1	- 5	euvoc		Time	(5:1	PI	inted Nac	ne:	3"			Time:	Printo	d Name:	Time:

Portland Harbor - Basin 22 Petroleum Sheen COC #2 (5-28-15)



Date: 5/28/15

Work Order #: WISE199

Collected By: MJ5, WC R, ECH, PHA

Page 2 of 2

	Client Name:	Director	's Office		- 10 Maria	,	7				-			-	10.5	Ä	-		_							7																												
	Project Name:	Portland	l Harbor											ä		4																																						
					81	154						R	equ	es	ted	An	alv	/se	s		ad				· · · · · · · · · · · · · · · · · · ·																													
Lab Number	2	ial Instructions: n 22 Petroleum Sheen Investigation n NWTPH-Dx and NWTPH-Gx if detected																																	PAHs (low-Level)	*	.5													Conductivity (umhos/cm)	Combo 5	☐ Standa	ind-Time Request: rd (10 business days) 5 business days)	(*)
Lab	Location ID	Sample Date	Sample Time	Grab or : Comp	Sample Matrix	NWTPH-HCID	PAHS (Conduc	Meter	# of Container	Remark																													
Ø 1	22_34_33	5/28/2015	1216	C 83	Sed	•						7		1								1			AAP79	1																												
12		5/28/2015	1408	000	Sed	•								•						3					AAM07	8																												
13	22_ 86\\/\frac{1}{1} PE	5/28/2015	1412	G	Wipe	•	7												7					3 (3)	AAM07 Wipe from Mi	8																												
	32M/be												T													*******																												
						1			-																a:																													
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	Relinguished By: Signature: Warf Bu Printed Name: Ma + + 5a	llin		28/14	Received B Signature: Printed Name:	h	130	L	-		T	5-25 ime:	8-15 5	s	teling Ignatur	t:	d By	<u>.</u>			Date: Time:	33	Sigm	elved By; dure: ed Name:	Date: Time;																													

DAILY FIELD REPORT





Page Project __ Project No. Location <u>OF22</u> Date $\sqrt{a/3}$ BY PHA/MIS/WRC/ECH Subject OF 32 Dry Weather to plis furbin the sediments Horival on si an sediment deposition at end Upstream as tras con see, No seas upstramin

DAILY FIELD REPORT





Page 2 of 3

Project Vallabler box Project No.
Location OFZZ Date 6/3/15
Location OFZZ Subject OFZZ Dry Weether Petroleum Shern Inv. By PHW/MJS/WER/ECH
185X- AAD796-CIC 1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-
1058-AAP796- Collected in the section to Souple from 8' lateral from (7239) worth.
722-38)
1122-AAP800- Acrived on site: no flow or sediment visible food above
18" upstran win 18" downstream min, lateral from west is 10"
1133-AAR800-Collected inline sedirent sample upstran of menhale. Due to
MJS & such sedinat volves sample collected directly into sample jar Dark (2240) Buildry of solids on wall of pipe included in sample. Material is
(22-39) on both sides of line approx 9" up the sides of pipe Approx to
extend upstrain approx 30'. There is no buildup on walls of downstrain
ling. The naterial is clay-like and has stated petroleon order. Sheen on
Water in sample.
1152 11 0000
1153 AAP802 - Arrived on site. Lateral From east perched lateral from
active flow lateral from NW. Som visible coase solids in marhole us active flow lateral from north bends east towards catch basin ANF250.
Literal From UW appears to come from catch basin ANFZY8. No
sampleable solids in any lateral. solids in number are course
and don't appear combanisated.
1224-ANF249-Arrived on Site, cutch basin breated in grave I west of
NW Front Ave min out let to south. Small proched lateral 3" appears to
be a weep hole that obesat go anywhere Outlet is 12" Approx. Sed went
Attachments depth is 15". Plastics, or a ics, instal styles on definis in CR

DAILY FIELD REPORT





Page 3 of 3

Project Yar Hand Hurbar	Project No.
Location DFZZ	Date <u>6/3/15</u>
Subject OF 22 Pry Weather Petroleon Streen Inv.	BY PHAMASS /WOR/ECH
14-ANF249 (cont.) - Outlet to south many com	
ANFZY8 on west side of NW Front Ave	
exits to the west, assume to catch besize	ioin into one live that
drains to AAP802 to NW (aten).	
1230-ANF249-Collected inline sediment sample ne	at outlet from catch busin.
1239 - On support Catchbasin in grave I on west sid	le of NW Fort Ave, Outlet,
drains to cast and appears to join main	midway between AAP799 and
AAR800 Catch basin is the sene size as A	WFZ49, but his no excep
holes Sedirent is dry and door is tapped	to get invol- flow. Dutlet
is 10", also 30" deep.	
1246 - Collected souline sediment suple near cut	ch basin outlet. Mastic,
mos patris, orgains, styritorn, trush debris.	
(CC1)	경기를 받는데 하다면 하는데 보다는데 맛있다. (1945년 등 년년) - 1일 : 1945년 - 1945년
(22-41)	
Attachments	



ENVIRONMENTAL SERVICES Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452



INLIN	E SEDIMENT S	AMPLING FIEL	D DATA SHEET	22_36
Project Name: Portland Harbor -	- Basin 22 Sheen Inves	stigation	Sample ID:	1 3 MIS
Sampling Team: MJS, ECH, WCR, PHA	Date: 6/3/15	Arrival Time:	Point Code: (5,	ce additional
Basin: 22	Node: AAP 7	799	Address:	Leollectieu
Current weather: Overcast, upw	ards of mid 60s		r.e	pert for
Date and time of last known rain	fall: ~0.2" 6/1/2015-6/2	/2015	14	2 3 3 3 3 AN 35
SECTI	ON 1 - PRE-SAMF	PLING VISUAL OF	SERVATION REP	ORT
Is there water inline? Yes or No	If present, water is:	Flowing or Standing D	Pepth of water = 1.5 in	Rate of flowfps
Does river back up to this location?	Yes or No If river is bac	ked up: Water Color	□ Brown □ Grey Water (□ Clear	☐ Hydrocarbon Odor ☐ Sanitary ☐ Other
Are sediments observed in the line? If sediments present: Avg Dept	Yes or No Are in	recoverable quantities of 10 MOLA STAY WE 2 CB IN LET Sed Depth Range = _	sediments present in the 15 to accumal 3 enter aytle in to	line? (Yes) or No
Estimated dimensions of sediment of	10	· · ·	As far as can be seen	
SITE DIAGRAM: Include street and extent of solids accumulatio	and the second s	locations.	• •	,
10" da		pipe contains mostly evarsa material wi some su	the atlet pi	ulets enter pe about 2' wall
30" 菱型	A4D	-	Q T 1 09	Sid numail
22.37	799			36 1937 " 020 - Samples
12-36	4		petrole v	2-37 33 200 made
xx sed subsample le cottens	Y see our fax	sociated FOS sumpline detail	gheen be	eame apparer ant stirred in mainline
	15" Sam	pled but flow	appears to ba	Page I of 2

·				The second se
Date: 0 3/16 SECTION 2	2 - SAMF	LE COL	LECTION REP	Node: Point Code:
Sampling Equipment: Stainless steel utensil	& stainless	s steel rec	eptacle □ Other	(Describe)
Equipment Decontamination process: Per S	OP 7.01a	□ Dev	ations (Describe)	And the state of t
03/15 1014	ole Identific	-	e (IL-XX-NNNNNN 22 22 22 22 22 22 22 22 22 22 22	36
Visual and olfactory observations: She	out 6 - abo r en	1 D5 v+	scribe below) of Whe DS: Color of sample	Brown Grey
Sample composition/particle size Silt/Clay	oloration _ 23_ Sa osed Orga	and 245	Fine Gravel 20 Other (describe)	Other (describe) Coarse Gravel 20 Debris 2
☐ Wood If present, type of debris in sample ☐ Metal ☐ Organ			Removed debris?	O CORV SC AMOUNT) INO
Compositing notes Per SOP5.01b □ Devia	ations (des	scribe)		
Sample Jars Collected (number, size, full or partia	al)?) 4	02 jav	1,411
If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).	Jar	Size	Amount Full	Target Analyses
		,	<u> </u>	
			<u> </u>	
Lab ID Here	Duplicate	e sample	collected? YN	
Duplicate sample identification # on COC:	Oup ID h	fere		
SECTIO	N 3 - PI	нотос	BRAPH LOG	
Overview of node showing drainage area		Filenam	e(s):	
Plan view of sediments inline		Filenam	ə:	
Homogenized sample (sediment in bowl)		Filenam	e:	
Other?		Filenam	a/e):	



ENVIRONMENTAL SERVICES

Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452



INLINE SEDIMENT SAMPLING FIELD DATA SHEET Sample ID: Project Name: Portland Harbor - Basin 22 Sheen Investigation Sampling Team: MJS, ECH, Point Code: Date: 6/3/15 Arrival Time: WCR, PHA Basin: 22 Address: Current weather: Overcast, upwards of mid 60s Date and time of last known rainfall: ~0.2" 6/1/2015-6/2/2015 SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT Yes or No If present, water is: Flowing on Rate of flow = Is there water inline? Standing/ Depth of water = ☐ Brown ☐ Hydrocarbon Does river back up to this location? Yes or No 1) If river is backed up: Water Color ☐ Grey Water Odor □ Sanitary ☐ Clear □ Other Yes or No Are sediments observed in the line? Yes for No Are recoverable quantities of sediments present in the line? If sediments present: Avg Depth of seds = Sed Depth Range = in Estimated dimensions of sediment deposit: in. OR As far as can be seen SITE DIAGRAM: Include street intersections/main lines/laterals/catch basins/MH's/pipe sizes/ flow direction/ driveways cuts and extent of solids accumulation as well as subsample locations. see map for AAP 799

A STATE OF THE STA							
Date: 6 (3/15	SECTION 2	2 - SAMP	LE COL	LECTION REPO	DRT	Node:	Point Code:
Sampling Equipment: Sta	inless steel utensil	& stainless	s steel rec	eptacle Other (Describe)	- Landan - L	I managaran
Equipment Decontamination p	process: Per S	OP 7.01a	□ Devi	ations (Describe)			
Sample date: Sample to 0 2	time: Samp	ole Identific	ation Cod	e (IL-XX-NNNNNN-	mmyy)	P4901	RA Q -790
Sample location. □ From M	H chamber & Fro	om line	If from	line, segment is Fro	m Node	То	Node
Sample collection technique:	Per SOP5.01b	□ Devi	ations (de	scribe below)			
Visual and olfactory observati			nted lppear	Color of sample		n r (describe)	
Sample composition/particl distribution (estimated percei	January Silvolay	osed Orga		Fine Gravel O Other (describe)	Coarse	Gravel 2	2 Debris
If present, type of debris in sa	□ Wood ample □ Metal □ Organ	□ Pla		Removed debris?	□ Yes (Type & Am	nount) XNo
Compositing notes Per S	SOP5.01b 🗆 Devia	ations (des	cribe)				
Sample Jars Collected (number	er, size, full or partia	ıl)?	(1)	402,5	2v []		
If not enough sample to fill all o collected and related analytes sanalyte priority list in work orde	sampled (as per	Jar	Size	Amount Full		Target A	nalyses
andly to promy not in from orde	• / • • •						
			-			· · · · · · · · · · · · · · · · · · ·	
Lab ID Here		Duplicate	e sample o	collected? Y/N			
Duplicate sample identification	# on COC:	Oup 10 h	iere				
						······································	
	SECTIO	N 3 - PI	нотос	RAPH LOG			
Overview of node showing dra	inage area		Filename	e(s):			
Plan view of sediments inline			Filename	ə: `			
Homogenized sample (sedime	nt in bowl)		Filename	e:		 	
Other?			Filename	5(6).		············	



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Project Name: Portland Harbor – Basin 22 Sheen Investigation			Sample ID: Miss							
Sampling Team: MJS, ECH, WCR, PHA	Date: 6/3/15	Arrival Time:	Point Code: 22_38							
Basin: 22	Node: AAP7	96	Address:							
Current weather: Overcast, upwards of mid 60s										
Date and time of last known rainfall: ~0.2" 6/1/2015-6/2/2015										
SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT										
Is there water inline? Yes or No.	1	<u></u>	of water = \tau_in Rate of flow = fps							
Does river back up to this location?		icked up: Water Color	Brown ☐ Hydrocarbon Grey Water Odor ☐ Sanitary Clear ☐ Other							
Are sediments observed in the line?	_YesoriNo ∣Are	recoverable quantities of sedir	ments present in the line? (Yes) or No							
If sediments present: Avg Depth		•	in. to in.							
Estimated dimensions of sediment deposit: in. by in. OR As far as can be seen										
SITE DIAGRAM: Include street intersections/main lines/laterals/catch basins/MH's/pipe sizes/ flow direction/ driveways cuts and extent of solids accumulation as well as subsample locations.										
₩ N		1050	2 regarded and have							
	15"	(00)	Sumpled Geogram							
wy wh	401		8 inlet about 3"							
subsample !	701		8 Sumpled sed from 8" inlet, about 3" upstream from MH chauber.							
locations			MH emanber.							
1311	$\triangle P$	rP)								
8"] 🟂	70	16	22-38							
	14811									
	「 									
	- •									

Date: 6 3 15 SECTION 2	- SAMF	PLE COL	LECTION REP	PORT	Node:	Point Code:		
Sampling Equipment: Stainless steel utensil &	& stainles	s steel rec	eptacle Other	(Describe)	· ·			
Equipment Decontamination process: Per So	OP 7.01a	□ Dev	ations (Describe)					
Sample date: Sample time: Sample	le Identific	Control Cod	e (IL XX-NUNNNNN)	I-mmyy) 1 – 38	10 20 B			
Sample location: From MH chamber From From MH chamber	m line	If from	line, segment is Fi	rom Node_	To No	de		
Sample collection technique: Per SOP5.01b	□ Devi	ations (de	scribe below)					
Visual and olfactory observations: Fell Shee		lppoars	Color of sample	, , -	describe)			
Sample composition/particle size Silt/Clay distribution (estimated percentages): Decomposition		and () () anics ()	Fine Gravel 0 Other (describe)		ravel <u> 20</u> D	ebris <u>5</u>		
Vooting aa	∕ t Pla		Removed debris?	u.5 pg	pe & Amour	nt) □ No		
Compositing notes Per SOP5.01b □ Devia	tions (de	scribe)		1	-			
Sample Jars Collected (number, size, full or partia	1)?	()	102,-	full				
If not enough sample to fill all of the jars, list jars	Jar	Size	Amount Full		Farget Analy	rses		
collected and related analytes sampled (as per analyte priority list in work order).	-	•			· .			
		•			·			
	<u> </u>				· · · · · · · · · · · · · · · · · · ·			
Lab ID Here	Duplicat	icate sample collected? Y/N)						
		Dup (Differe						
					-			
	- 5							
SECTION	N 3 - P	нотос	BRAPH LOG					
Overview of node showing drainage area			Filename(s):					
Plan view of sediments inline	Filename:							
Homogenized sample (sediment in bowl)			Filename:					
Othor?			Filonomo(s):					



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INLINE SEDIMENT SAMPLING FIELD DATA SHEET Project Name: Portland Harbor - Basin 22 Sheen Investigation Sample ID: 11 Sampling Team: MJS, ECH, Date: 6/3/15 Point Code: Arrival Time WCR, PHA Basin: 22 Address: Current weather: Overcast, upwards of mid 60s Date and time of last known rainfall: ~0.2" 6/1/2015-6/2/2015 SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT Depth of water = Vall in Rate of flow = Is there water inline? Yes or No If present, water is: Flowing or Standing □ Hydrocarbon ☐ Brown Does river back up to this location? Yes or No ☐ Grey ☐ Sanitary If river is backed up: Water Color Water Odor ☐ Other ☐ Clear

Are sediments observed in the line? Yes for No | Are recoverable Are recoverable quantities of sediments present in the line? Xes or No Avg Depth of seds = Trall in Sed Depth Range = If sediments present: SITE DIAGRAM: Include street intersections/main lines/laterals/catch basins/MH's/pipe sizes/ flow direction/ driveways cuts and extent of solids accumulation as well as subsample locations. XX ged subsample petroleum FOG 18" line on walls above high water mark.

0

Date: 0 3/15 SECTION 2	- SAMP	LE COL	LECTION REP	ORT	Node:	Point Code:
Sampling Equipment: Stainless steel utensil 8	stainless	steel rec	eptacle □ Other	(Describe)		
Equipment Decontamination process: Per SC	DP 7.01a	□ Devi	ations (Describe)	_		
Sample date: Sample time: Sampl	e Identific	ation Cod	e (IL-XX-NNNNNN	1-mmyy) 2 _ 3 q	2000	- tronu
Sample location: □ From MH chamber 🗡 Fro	m line	If from	line, segment is Fr	om Node_	To No	ode
Visual and olfactory observations: Shee	lume potr	pir	- Annya - Ada	□ Browr	ON Pip (describe)	
Sample composition/particle size Silt/Clay distribution (estimated percentages): Decomposition			Fine Gravel Other (describe)	Coarse (Gravel [Debris
□ Wood If present, type of debris in sample □ Metal □ Organi	□ Pla		Removed debris?	□ Yes (Type & Amou	nt) 🗆 No -
Compositing notes ☐ Per SOP5.01b Devia	tions (des	scribe) (nee above	2		
Sample Jars Collected (number, size, full or partial)? (1) 니	02 ful			
If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).	Jar	Size	Amount Full		Target Anal	yses
Lab ID Here	Duplicate	e sample o	collected? Y/N)		•	
Duplicate sample identification # on COC:	Dup ID F	iere				
SECTION	N 3 - PI	нотос	RAPH LOG			
Overview of node showing drainage area		Filenam	e(s):			*
Plan view of sediments inline		Filenam	==== €:			
Homogenized sample (sediment in bowl)		Filenam	e: [^]			
Other?	-	Filenam	a(s).			



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ENVIRONMENTAL SERVICES

Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452



INLINE SEDIMENT SAMPLING FIELD DATA SHEET Project Name: PORTLAND HARBOR - BASIN Sample ID: No Sample ID: POLITION Sampling Team: MG, ECH Date/ Arrival Time Point Code: WCD PHA Node: Basin: 7 Address: Current weather: UVRVCast IVDWaVD ~ Q.2" Date and time of last known rainfall: SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT V R C in Rate of flow = CIf present, water is: Flowing or Standing Is there water inline? Yes) or No ☐ Brown ☐ Hydrocarbon Does river back up to this location? Yes of No If river is backed up: ☐ Grey ☐ Sanitary Water Color Water Odor ☐ Clear □ Other Are sediments observed in the line? Yes, or No Are recoverable quantities of sediments present in the line? Yes for No COOVER Sed Depth Range = If sediments present: Avg Depth of seds = _in, OR □ As fatas can be seen AVAVIA O A ON MAN Estimated dimensions of sediment deposit: SITE DIAGRAM: Include street intersections/main lines/laterals/catch basins/MH's/pipe sizes/ flow direction/ driveways cuts and extent of solids accumulation as well as subsample locations. 10" in lets 34" off elember floor northern 10" inlet bends to right towards ANF 750 - has seds but not reachable

Date: SE0	CTION 2	2 - SAMPI	LE COL	LECTION REP	ORT	Node:	Point Code:
Sampling Equipment: Stainless ste	el utensil	& stainless	steel rec	eptacle Other	(Describe)		
Equipment Decontamination process:	□ Per S	OP 7.01a	□ Devi	ations (Describe)			
Sample date: Sample time:	Sam	ole Identifica	ation Cod	e (IL-XX-NNNNNN	-mmyy)		
Sample location: From MH chambe	er 🗆 Fr	om line	If from	line, segment is Fr	om Node	To	Node
Sample collection technique: ☐ Per SO	P5.01b	□ Devia	tions (de	scribe below)		, , , , , , , , , , , , , , , , , , , ,	
Visual and olfactory observations:	□ She	r en coloration		Color of sample		••	
Sample composition/particle size distribution (estimated percentages):	Silt/Clay Decomp	Sar osed Orgar	nd nics	Fine Gravel Other (describe)			_ Debris
If present, type of debris in sample	□ Wood □ Metal □ Organ			Removed debris?	□ Yes (Type & Am	ount) □ No
Compositing notes ☐ Per SOP5.01b	□ Devi	ations (desc	cribe)				
Sample Jars Collected (number, size, fu	ll or partia	al)?					
f not enough sample to fill all of the jars, collected and related analytes sampled (analyte priority list in work order).		Jars	Size	Amount Full		Target An	alyses
Lab ID Here		Duplicate	sample o	collected? Y/N			
Duplicate sample identification # on CO	C:	Dup ID H	818				· · · · · · · · · · · · · · · · · · ·
S	ECTIO	N 3 - PI	ЮТОС	RAPH LOG			
Overview of node showing drainage are	а		Filename	e(s):			<u>and an analysis of the Market of the Common of the Common</u>
Plan view of sediments inline			Filename				······································
Homogenized sample (sediment in bow	l)		Filename	э:			
Other?			Filename	e(s):			



CITY OF PORTLAND

ENVIRONMENTAL SERVICES Water Pollution Control Laboratory 6543 N. Burlington Ave., Portland, OR 97203-5452



CATCH BASIN SOLIDS SAMPLING

	1A SHEEL
Project Name: Portland Harbor – Basin 22 Sheen Investigatio	Sample ID: 22_40
Sampling Team: MJS, ECH, WCR, PHA Date: 6/3/15	Arrival Time: Point Code:
Basin: 22 Node: ANF 2	Un Address:
Current weather: Overcast, upwards of mid 60s	(n/230)
Date and time of last known rainfall: ~0.2" 6/1/2015-6/2/2015	aprinkled about 10 min, did vite
SECTION 1 - PRE-SAMPLING	VISUAL OBSERVATION REPORT
Indicate observed erodible solids or adjacent operations that could impact catch basin:	vities □ Materials Storage □ On-site Processes Heavy Truck Traffic □ Other
	oris clogging
Is there standing water in catch basin? Yes No	Depth of standing water, if present =in
Organics	Metals ☐ Hydrocarbon odor ored Sediment ☐ Paper ☐ Solvent odor ☐ Cigarette butts ☐ Other: अप्रमुख्यू
Total depth of catch basin =in Average sec	diment depth = 15 in Sed depth range = 12 in to 18 in
CONCRETE SIRVEL MEZHA	appears to ANF 250 To ANF 202 The seep hole To ANF 250 The seep hole The see
22-40 22-41 M35	

Date: 6 3/6 SECTION	2 - SAMPLE C	OLLECTION REF	PORT	Node:	Point Code:
Sampling Equipment: Stainless steel ut	ensil & stainless s	teel receptacle 🛚 🗆	Other (desc	ribe)	
Equipment decontamination procedure:	Per SOP7.01a	□ Deviations (desc	ribe)		
Sample Date: Sample Time:	Sample Identifica	tion Code (IL-XX-NNN	NNN-mmyy) _40		
Sample collection technique: Per 2003 CH2) 2M Hill SOP – Gui	dance for Sampling of	Catch Basin	Śolids	
Per SOP5.02a - Inline Sampling of Sto MW P(2) CIVLE + MAIN 1 ABUNDANCE AF MAIN	te jov al	Deviations (desc	uized	, , , , , , , , , , , , , , , , , , , ,	due
Visual or olfactory evidence of Sh	dor <u>ear</u>	Color of sample		(describe)	
Sample composition/particle size Silt/Cl distribution (estimated percentages): Decor	ay 10 Sand 2	Fine GravelOOOther (describe		avel De	bris
□ Wo If present, type of debris in sample □ Met □ Org		cks Removed debris	• / -	ype & Amoun	t) = No Prior (cetier
Compositing notes ★ Per SOP5.01a □ Devia	itions (describe)			to col	(cetiev
Sample jars collected (number, size, full or par	rtial)?	1) 407,	foll.		
If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).	Jar Size	Amount Full		arget Analys	es
(as per analyte priority list in work order).					
		<u> </u>			
Lab ID Here	Duplicate sample	collected? YN	l		
Duplicate sample identification # on COC:	Dup ID Here				
			_		
SECT	ION 3 - PHO	TOGRAPH LO	3		
Overview of CB showing drainage area	File	ename(s):			
Catch basin plan view prior to sampling showi	ng solids File	ename:	-		
Pipe connections to/from CB	File	ename(s):			
					



CITY OF PORTLAND

ENVIRONMENTAL SERVICES

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CATCH BASIN SOLIDS SAMPLING FIELD DATA SHEET Project Name: PORTLAND HARBOR - BASIN 27 SAMPLED INVESTIGATION Sampling Team: MJS, ECH, WUR, Date: 6 3/15 Node: VMMAPPED CB Address: Perween HAPJAC, AMPROS Current weather: Overcast, vpwards of mid 605 Date and time of last known rainfall: 20.2" 6/1-6/2/15, 1/24t spwinkle but no vunoff

ATA '	
Basin: ${\mathcal W}$	Node: VMMapped CB Address: Address: Address: AAPFACI AAPFACI
Current weather: Overcast,	1000 aves of mid (01) 5
Date and time of last known rainfall:	0.2" 6/1-6/2/15, light sprinkle but no runoff
Market Control of the	PRE-SAMPLING VISUAL OBSERVATION REPORT
Indicate observed erodible solids or adjacent operations that could impact catch basin:	☐ Construction Activities ☐ Materials Storage ☐ On-site Processes ☐ ☐ Erosion ☐ Activities ☐ Materials Storage ☐ Other ☐ Other ☐ ☐ Other ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Percent of catch basin grate clogged = $\frac{l}{l}$	Type of debris clogging
Is there standing water in catch basin?	☐ Yes ☑ No Depth of standing water, if present =in
Note visual or olfactory observations	Plastics ☐ Metals ☐ Hydrocarbon odor Oily Sheen/Discolored Sediment ☐ Paper ☐ Solvent odor ☐ Organics ☐ Cigarette butts ☐ Other:
Total depth of catch basin = 30	_in Average sediment depth = 15 in Sed depth range = 6 in to 8 in
SITE DIAGRAM: Include street intersections, etc.	ctions, inlets and outlets, catch basin dimensions, sediment depth detail, subsample
iocations, etc.	Zoll
1401	124 Co-sumpled seds from
T + 101	catch busin just
	20"1 1246-sumpled seds from cotell busin just prior to 10" outlet
30"	MJS MJS
	22-41
·	
XXX sed subsample locations	
(oen 1 co	

		<u></u>	
Date: 6/3/15 SECTIO	N 2 - SAMPL	E COLLECTION REP	PORT Node: Point Code:
Sampling Equipment: Stainless steel	utensil & stainle	ss steel receptacle 🗆	Other (describe)
Equipment decontamination procedure:	Per SOP7.01a	a □ Deviations (descr	ribe)
Sample Date: Sample Time: 1246	Sample Ident	tification Code (IL-XX-NNN	INNN-mmyy) ススーリ
Sample collection technique. □ Per 2003 CI	H2M Hill SOP -	Guidance for Sampling of	Catch Basin Solids
contamination in composite sample	into jar	and homoge	ribe below) Mized in av Brown Grey Other (describe)
Sample composition/particle size Silt/o distribution (estimated percentages): Dec	Clay <u>[</u>	nd <u>名</u> Fine Gravel nics <u>像</u> Other (describe	Coarse Gravel Debris)
If present, type of debris in sample □ M	Vood □ Larg letal □ Plas organics □ Pap	ge rocks stic Removed debris er was	2 X Yes (Type & Amount) I No Nextraded prior to collection
Compositing notes Per SOP5.01a □ Dev	riations (describ	e)	to collection
Sample jars collected (number, size, full or p	vartial)?) Hozful	
If not enough sample to fill all of the jars, list	Jar Size	Amount Full	Target Analyses
jars collected and related analytes sampled (as per analyte priority list in work order).			
Lab ID Here		nple collected? Y/N	
Duplicate sample identification # on COC:	Dup 10 Here		
SEC	TION 3 - PI	HOTOGRAPH LOC	
Overview of CB showing drainage area	*1		
	· 	Filename(s):	
Catch basin plan view prior to sampling show	wing solids	Filename(s): Filename:	
Catch basin plan view prior to sampling shown Pipe connections to/from CB	wing solids		

Water Pollution Control Laboratory 6543 N. Burlington Ave:
Portland, Oregon. 97203-4552
Sample Custodian: (503) 823-5696
General Lab: (503) 823-5681

Portland Harbor - Basin 22 Petroleum Sheen COC #1 (6-3-15)



Date: 6/3/15
Work Order #: W15F04/
Collected By: M35,PHA,ECH,WCR

Page _ i _ of _

	Clier	t Name:	Director	's Office	<u>-</u>	· · · · ·			· · ·	<u> </u>		<u> </u>							·		·	
	Proje	ct Name:	Portland	l Harbor	:																	
									-		R	eau	ıest	ed A	nai	VSe						
	Speci	al Instructions:		****		-							T		T		_		T	Τ		· · · · · · · · · · · · · · · · · · ·
	Basir	22 Petroleum Sh	een Investi	igation						'											Turn-Aroun	d-Time Request:
Lab Number	¹ Run	NWTPH-Dx and N		if detected	i d	7	HCID1														Standard Rush (5 t	(10 business days) pusiness days)
Lab		Location ID	Sample Date	Sample Time	Grab or 3	Sample Matrix	NWTPH-HCID1														# of Containers	Remarks
01		22_37 36	6/3/2015	1014	<i>B</i>	Sed	•														1	AAP799 Inline Sediment DS
2		22_ 38 3 7	6/3/2015	1020	S C	Sed	•														1	AAP799 Inline Sed - 15" W Lat
3	· [-	22_39 33	6/3/2015	1058	<u>ر</u> اور	Sed	•														1	AAP796 Inline Sed - 8" N Lat
4		22_70 39	6/3/2015	1133	C 18	Sed	•														ı	AAP800 Inline Sediment - US
5		22_N 40	6/3/2015	1230	<i>B</i>	Sed	•												·		(ANF249 Inline Sed - CB Outlet
6		22_42,41	6/3/2015	1246	٦	Sed	•														(CB to AAP799 AAP800 Inline Sed - CB Outlet
	11 11 11 11				· .																	
																	·					
	Relings Signature	shed By: Mult Bn	Ohin	Date)		Received B Signature	ν <u>:</u> Α	w		_ (o S Tinha:	ς		elinguis pature:	hed B	<u>y:</u>	<u> </u>	,	Date;		ceived By:	Date:
	Printed N	not 1 3-11 N	m-	Times LH G		Printed Name:	l'est	+300	٠		ा _{गलीवः} 146		-	inted Nam	18:	<u></u>	-		Times	Pric	ited Name:	Time:

Attachment D Laboratory Results

Investigation Day One May 27, 2015



55 SW Yamhill Street, Suite 400 Portland, OR 97204 P: 503.239.8799 F: 503.239.8940 info@gsiwatersolutions.com www.qsiwatersolutions.com

Laboratory Data QA/QC Review Petroleum Sheen Investigation Outfall Basin 22

To: File

From: Andrew Davidson, GSI

Date: June 23, 2015

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated during a source control investigation sampling event conducted by the City of Portland (City). Six composite inline solids samples, nine dry weather flow (DWF) grab samples, six wipe samples, and one field decontamination blank sample were collected in Outfall Basin 22 on May 27, 2015 and submitted for analyses.

The laboratory analyses for these source control program samples were completed by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and included the following analyses:

BES WPCL

- o Total Solids SM 2540 G (Inline solids samples only)
- o Field Conductivity FO SOP 1.03a
- o Hydrocarbon Analysis NWTPH-HCID (NWTPH-Dx if detected)
- Polycyclic Aromatic Hydrocarbons (PAHs) EPA 8270-SIM (DWF samples only)

The WPCL summary report for all analyses associated with this sampling event is attached for review.

The following QA/QC review of the analytical data is based on the available documentation provided by WPCL. The QA/QC review consisted of reviewing the following elements from the laboratory report, if applicable and available:

- Chain-of-custody for completeness and continuous custody
- Analysis conducted within holding times
- Chemicals of interest detected in method blanks and/or field decontamination blanks

- Internal standard recoveries within laboratory control limits
- Surrogate recoveries within laboratory control limits
- Matrix spike/matrix spike duplicate (MS/MSD) sample results within laboratory control limits
- Laboratory control/duplicate laboratory control (LC/DLC) sample recoveries within laboratory control limits
- Relative percent differences (RPDs) for laboratory duplicate samples within laboratory control limits.

The results of the QA/QC review of the subcontracted laboratory reports are presented below.

Chain-of-Custody

The chain-of-custody forms showed continuous custody of the samples. The chain-of-custody procedures appear to have been adequate indicating that sample integrity was maintained throughout the sample collection and delivery process.

Analysis Holding Times

The samples were extracted and analyzed within the recommended method-specific holding times.

Method Blanks

Method blanks were processed during the hydrocarbon scan analysis (NWTPH-HCID) and the analysis of diesel/oil hydrocarbons (NWTPH-Dx) for wipe, DWF, and inline solids samples. No analytes were detected in any of the blank samples processed during the analysis of hydrocarbons in wipe, DWF, or inline solids samples. One method blank sample was processed during the analysis of PAHs. No analytes were detected in the method blank sample.

Field Decontamination Blanks

One field decontamination blank was collected during the sampling event and analyzed for petroleum hydrocarbons and PAHs. No target analytes were detected in the field decontamination blank.

Surrogate Recoveries

Surrogate recoveries were processed during the laboratory analyses of hydrocarbons and PAHs. Surrogate recoveries were within control limits with the following exceptions:

• High concentrations of hydrocarbons in samples W15E194-19 and W15E194-20 prevented determination of surrogate recoveries during the initial hydrocarbon scan (NWTPH-HCID). Despite the sample undergoing silica gel-cleanup, associated surrogate recoveries could not be determined in these same samples during the diesel/oil analysis (NWTPH-Dx) due to required dilutions of the sample extract. Accordingly, diesel/oil hydrocarbon results for these samples are qualified as estimates and flagged "J" due to

- unacceptable surrogate recovery "SR"; that is there is a degree of uncertainty associated with the values due to the high dilutions that prevented acceptable recovery of the surrogate compound 2-Fluorobiphenyl.
- Recovery of the surrogate compound 2-Fluorobiphenyl was below acceptance limits for the DWF sample W15E194-21 during the NWTPH-Dx analysis. WPCL reports that the sample results may be low estimates. Accordingly, diesel/oil hydrocarbon results for this sample are qualified as estimates and flagged "J" due to unacceptable surrogate recovery "SR".
- Recovery of the surrogate compound fluoranthene-d10 was below acceptance criteria during the analysis of PAHs for the DWF sample W15E194-21. WPCL reports that associated sample results may be low estimates. Accordingly, associated target compounds for fluoranthene-d10 (fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene) are flagged as estimates "J" due to surrogate recovery outside acceptance limits "SR".

Matrix Spike/Matrix Spike Duplicate

MS/MSD samples were prepared using aliquots of DWF sample W15E194-05 and processed during the laboratory analysis of PAHs in DWF samples. MS/MSD recoveries and RPDs were within acceptance limits for all spiked analytes.

Laboratory Control Samples/Duplicate Laboratory Control Samples

LCS samples were processed during the analyses of hydrocarbons in wipe, DWF, and inline solids samples and during the analyses of PAHs in DWF samples. DLC samples were processed during the analyses of hydrocarbons in DWF samples. All laboratory control sample recoveries and RPDs were within laboratory control limits.

Duplicate Samples

Duplicate samples were processed during the analyses of total solids and hydrocarbons (NWTPH-HCID and NWTPH-Dx) for inline solids samples. All RPDs were within acceptance criteria.

Additional Information

WPCL reports the following additional information regarding wipe, DWF, and inline solids samples:

• For samples where hydrocarbons were detected by the initial hydrocarbon scan (NWTPH-HCID), additional analyses NWTPH-Dx and NWTPH-Gx were to be run. WPCL reports that no VOAs were available for follow-up analysis of NWTPH-Gx on water samples; no extra jars were available for follow-up analysis of NWTPH-Gx on inline solids; no additional sample available for follow-up analysis of NWTPH-Gx on the wipe samples. Accordingly, only NWTPH-Dx analyses were conducted for the samples where hydrocarbons were detected by NWTPH-HCID.

- All samples analyzed by NWTPH-Dx underwent silica gel clean-up.
- WPCL reports that detections quantified as Diesel and Lube Oil in samples W15E194-01, W15E194-02, W15E194-03, W15E194-04, W15E194-05, W15E194-06, and W15E194-12 actually appear to be a single petroleum product that is heavier than Diesel #2 and lighter than the reference lube oil. The data are qualified as estimates "J" due to inadequate matching with the reference compounds "RC".
- WPCL reports that the fuel pattern in samples W15E194-01, W15E194-02, W15E194-03, W15E194-04, W15E194-05, W15E194-06, W15E194-12, and W15E194-15 most closely resembles transformer oil. Specifically, WPCL reports that samples W15E194-02, W15E194-03, W15E194-04, W15E194-06, and W15E194-12 resemble a non-Aroclor transformer oil.
- WPCL reports that during the initial hydrocarbon scan, results for gasoline and lube oil in samples W15E194-19 and W15E194-20 were primarily due to overlap from diesel-range hydrocarbons. These detections are qualified as estimates "J" in subsequent tables to indicate matrix interference "MI".
- WPCL qualifies that reported analytes for the hydrocarbon analyses of wipe samples (quantified in mg/Wipe) are not certified under the National Environmental Laboratory Accreditation Program (NELAP).



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June 17, 2015 Linda Scheffler

Director's Office

 Work Order
 Project
 Received

 W15E194
 Portland Harbor
 05/27/15 15:51

Enclosed are the results of analysis for the above work order. If you have questions concerning this report, please contact your project coordinator Peter Abrams at 503-823-5533.

Jennifer Shackelford

Laboratory Coordinator QA/QC

Jennifer Shackelford







6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

LABORATORY ANALYSIS REPORT

Project: Portland Harbor

Work Order: **W15E194**Received: 5/27/15 15:51

Submitted By: Field Operations

Client: Director's Office Project Mgr: Linda Scheffler

				Sample Col	lection Date	
Sample	Laboratory ID	Matrix	Type	Start	End	Qualifier
22_8	W15E194-01	Sediment	Grab	05/27/15 09:29	05/27/15 09:29	
22_8W	W15E194-02	Water	Grab	05/27/15 09:30	05/27/15 09:30	
22_9W	W15E194-03	Water	Grab	05/27/15 10:04	05/27/15 10:04	
22_4W	W15E194-04	Water	Grab	05/27/15 10:09	05/27/15 10:09	
22_5W	W15E194-05	Water	Grab	05/27/15 10:13	05/27/15 10:13	
22_10W	W15E194-06	Water	Grab	05/27/15 10:49	05/27/15 10:49	
FDBLANK	W15E194-07	Water	Grab	05/27/15 11:21	05/27/15 11:21	
22_11	W15E194-08	Sediment	Composite	05/27/15 11:05	05/27/15 11:05	
22_12Wipe	W15E194-09	Wipe	Grab	05/27/15 11:40	05/27/15 11:40	
22_13Wipe	W15E194-10	Wipe	Grab	05/27/15 11:47	05/27/15 11:47	
22_14Wipe	W15E194-11	Wipe	Grab	05/27/15 11:53	05/27/15 11:53	
22_15W	W15E194-12	Water	Grab	05/27/15 11:59	05/27/15 11:59	
22_13W	W15E194-13	Water	Grab	05/27/15 12:01	05/27/15 12:01	
22_14	W15E194-14	Sediment	Composite	05/27/15 12:09	05/27/15 12:09	
22_16	W15E194-15	Sediment	Composite	05/27/15 12:12	05/27/15 12:12	
22_17Wipe	W15E194-16	Wipe	Grab	05/27/15 12:49	05/27/15 12:49	
22_18	W15E194-17	Sediment	Composite	05/27/15 12:53	05/27/15 12:53	
22_19	W15E194-18	Sediment	Composite	05/27/15 13:15	05/27/15 13:15	
22_20Wipe	W15E194-19	Wipe	Grab	05/27/15 13:22	05/27/15 13:22	
22_21W	W15E194-20	Water	Grab	05/27/15 13:27	05/27/15 13:27	
22_22W	W15E194-21	Water	Grab	05/27/15 13:45	05/27/15 13:45	
22_23Wipe	W15E194-22	Wipe	Grab	05/27/15 13:51	05/27/15 13:51	

Case Narrative

PAH/phthalates by 8270-SIM Analysis: Only PAH analysis was requested. Phthalates are not reported.

Analyte	Result Units	MRL	MDL	Dil. Batch	Prepared	Analyzed	Method	Qualifier
Field Parameters								
Field conductivity								

22_8W: W15E194-02

Conductivity* 309 umhos/cm 1 B15E421 05/27/15 FO SOP 1.03a

Reported: 06/17/15 13:47

Jennifer Shackelford

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Jennifer Shackelford, Laboratory Coordinator QA/QC





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Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Field Parameters						•			<u> </u>
Field conductivity									
22_10W : W15E194-06 Conductivity*	322 umhos/cm			1	B15E421	05/27/15	05/27/15	FO SOP 1.03a	
22_15W : W15E194-12 Conductivity*	324 umhos/cm			1	B15E421	05/27/15	05/27/15	FO SOP 1.03a	
22_13W : W15E194-13 Conductivity*	679 umhos/cm			1	B15E421	05/27/15	05/27/15	FO SOP 1.03a	
22_21W : W15E194-20 Conductivity*	482 umhos/cm			1	B15E421	05/27/15	05/27/15	FO SOP 1.03a	
22_22W : W15E194-21 Conductivity*	187 umhos/cm			1	B15E421	05/27/15	05/27/15	FO SOP 1.03a	
General Chemistry									
Total Solids									
22_8 : W15E194-01 Total solids	77.5 % W/W	0.01			B15E432	05/28/15	05/29/15	SM 2540G	
22_11 : W15E194-08 Total solids	79.2 % W/W	0.01			B15E432	05/28/15	05/29/15	SM 2540G	
22_14 : W15E194-14 Total solids	51.4 % W/W	0.01			B15E432	05/28/15	05/29/15	SM 2540G	
22_16 : W15E194-15 Total solids	58.0 % W/W	0.01			B15E432	05/28/15	05/29/15	SM 2540G	
22_18 : W15E194-17 Total solids	80.4 % W/W	0.01			B15E432	05/28/15	05/29/15	SM 2540G	
22_19 : W15E194-18 Total solids	82.5 % W/W	0.01			B15E432	05/28/15	05/29/15	SM 2540G	

Reported: 06/17/15 13:47

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Jennifer Shackelford, Laboratory Coordinator QA/QC





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Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifie
uels									
iesel/Oil Hydrocarbons by GC-	FID								
22_8 : W15E194-01									F
Diesel	81 mg/kg dry	26		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	F0, F
Lube oil	110 mg/kg dry	51		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	F0, F
Surrogate	Result	Expected	%Rec	Limits(%	5)				
2-Fluorobiphenyl	18.7 mg/kg dry	20.6	91%	50-150	B15F046	06/03/15	06/03/15	NWTPH-Dx	
22_8W: W15E194-02									F
Diesel	2.0 mg/L	0.066		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
Lube oil	0.57 mg/L	0.13		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
Surrogate	Result	Expected	%Rec	Limits(%	5)				
2-Fluorobiphenyl	0.0955 mg/L	0.105	91%	50-150	B15F001	06/01/15	06/03/15	NWTPH-Dx	
22_9W: W15E194-03									F ⁻
— Diesel	3.0 mg/L	0.069		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
Lube oil	0.69 mg/L	0.14		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
Surrogate	Result	Expected	%Rec	Limits(%	5)				
2-Fluorobiphenyl	0.112 mg/L	0.111	100%	50-150	B15F001	06/01/15	06/03/15	NWTPH-Dx	
22 4W : W15E194-04									F ⁻
Diesel	1.3 mg/L	0.070		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
Lube oil	0.28 mg/L	0.14		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
Surrogate	Result	Expected	%Rec	Limits(%	5)				
2-Fluorobiphenyl	0.0993 mg/L	0.112		50-150	B15F001	06/01/15	06/03/15	NWTPH-Dx	
22_10W : W15E194-06									F ⁻
Diesel	1.9 mg/L	0.066		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
Lube oil	0.25 mg/L	0.13		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
Surrogate	Result	Expected	%Rec	Limits(%					
2-Fluorobiphenyl	0.0831 mg/L	0.106	78%	50-150	B15F001	06/01/15	06/03/15	NWTPH-Dx	
22_15W : W15E194-12									F [*]
Diesel	0.93 mg/L	0.066		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
Lube oil	0.46 mg/L	0.13		1	B15F001	06/01/15	06/03/15	NWTPH-Dx	F0, F
Surrogate	Result	Expected	%Rec			00/01/10	00/00/10	TTTTT TO	. 0, .
2-Fluorobiphenyl	0.0790 mg/L	0.105	75%	50-150	B15F001	06/01/15	06/03/15	NWTPH-Dx	
22_13W : W15E194-13									F ⁻
Diesel	0.49 mg/L	0.066		1	B15F057	06/03/15	06/09/15	NWTPH-Dx	Г
				1	B15F057				
Lube oil Surrogate	ND mg/L Result	0.13 Expected	%Rec			06/03/15	06/09/15	NWTPH-Dx	
2-Fluorobiphenyl	0.0901 mg/L	0.106		-	B15F057	06/03/15	06/09/15	NWTPH-Dx	
22_16 : W15E194-15									F
22_10 . W13E194-13 Diesel	78 mg/kg dry	34		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	F
Lube oil	220 mg/kg dry	5 4 68		1	B15F046		06/03/15	NWTPH-Dx	ŗ
Surrogate	Result	expected	%Ror			06/03/15	00/03/13	INVVIFIT-DX	
2-Fluorobiphenyl	26.2 mg/kg dry	27.1		-	») В15F046	06/03/15	06/03/15	NWTPH-Dx	

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Jennifer Shackelford





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Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

						_			
Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Fuels									
Diesel/Oil Hydrocarbons by GC-FI	D								
22_20Wipe : W15E194-19									F7
 Diesel*	290 mg/Wipe	31		25	B15E430	05/29/15	06/03/15	NWTPH-Dx	
Lube oil*	ND mg/Wipe	62		25	B15E430	05/29/15	06/03/15	NWTPH-Dx	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.00 mg/Wipe	0.100	%	50-150	B15E430	05/29/15	06/03/15	NWTPH-Dx	SU5
22 21W : W15E194-20									F7
Diesel	130 mg/L	7.3		100	B15F057	06/03/15	06/09/15	NWTPH-Dx	
Lube oil	ND mg/L	15		100	B15F057	06/03/15	06/09/15	NWTPH-Dx	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.00 mg/L	0.116	%	50-150	B15F057	06/03/15	06/09/15	NWTPH-Dx	SU5
22_22W : W15E194-21									F7
Diesel	1.7 mg/L	0.12		1	B15F057	06/03/15	06/09/15	NWTPH-Dx	
Lube oil	2.7 mg/L	0.25		1	B15F057	06/03/15	06/09/15	NWTPH-Dx	
Surrogate	Result	Expected	%Rec	•		00/00/10	00/00/10	WII II DX	
2-Fluorobiphenyl	0.0828 mg/L	0.200		50-150	B15F057	06/03/15	06/09/15	NWTPH-Dx	SU1
Hydrocarbon Scan by GC-FID									
22 9 : \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\									
22_8 : W15E194-01	ND manufacture days	00		4	D45E400	05/00/45	05/00/45	NWTDLLLIGID	
Gasoline	ND mg/kg dry	23		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Diesel	DET mg/kg dry	58		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Lube oil	ND mg/kg dry Result	115	9/ Dag	1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Surrogate 2-Fluorobiphenyl	9.89 mg/kg dry	Expected 11.5		50-150	o) B15E420	05/28/15	05/28/15	NWTPH-HCID	
22_8W : W15E194-02	0 0 7								
Z2_0VV . VV 13L 194-02 Gasoline	ND ma/l	0.26		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Diesel	ND mg/L	0.53		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Lube oil	DET mg/L DET mg/L	0.53		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Surrogate	Result	Expected	%Rec			00/01/13	00/01/13	NW IFTI-IICID	1 04, 1 0
2-Fluorobiphenyl	0.0963 mg/L	0.105		50-150	B15F001	06/01/15	06/01/15	NWTPH-HCID	
22 9W : W15E194-03	· ·								
Gasoline	ND ma/l	0.28		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
	ND mg/L	0.26					06/01/15	NWTPH-HCID	F0a, F8
Diesel	DET mg/L	0.56		1 1	B15F001 B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Lube oil Surrogate	DET mg/L Result	Expected	% Poc			06/01/15	00/01/15	NWIFH-HCID	104,10
2-Fluorobiphenyl	0.107 mg/L	0.111			9) B15F001	06/01/15	06/01/15	NWTPH-HCID	
	3								
22_4W : W15E194-04									
Gasoline	ND mg/L	0.28		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0 F0
Diesel	DET mg/L	0.56		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Lube oil	DET mg/L	0.56	0/5	1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Surrogate 2-Fluorobiphenyl	Result 0.0978 mg/L	Expected 0.112			6) B15F001	06/01/15	06/01/15	NWTPH-HCID	
	0.0370 Hig/L	0.112	0770	30-130	וטרטטו	00/01/10	00/01/13	NVV IFII-MCID	
22_5W : W15E194-05		_							
Gasoline	ND mg/L	0.28		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	

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Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Fuels									
Hydrocarbon Scan by GC-FID									
22_5W : W15E194-05									
Diesel	ND mg/L	0.56		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Lube oil	ND mg/L	0.56		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0863 mg/L	0.112	77%	50-150	B15F001	06/01/15	06/01/15	NWTPH-HCID	
22_10W: W15E194-06									
Gasoline	ND mg/L	0.27		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Diesel	DET mg/L	0.53		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Lube oil	DET mg/L	0.53		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0943 mg/L	0.106	89%	50-150	B15F001	06/01/15	06/01/15	NWTPH-HCID	
FDBLANK: W15E194-07									
Gasoline	ND mg/L	0.27		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Diesel	ND mg/L	0.55		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Lube oil	ND mg/L	0.55		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0721 mg/L	0.110	66%	50-150	B15F001	06/01/15	06/01/15	NWTPH-HCID	
22 11 : W15E194-08									
Gasoline	ND mg/kg dry	22		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Diesel	ND mg/kg dry	56		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Lube oil	ND mg/kg dry	112		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	7.48 mg/kg dry	11.2	67%	50-150	B15E420	05/28/15	05/28/15	NWTPH-HCID	
22_12Wipe: W15E194-09									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0902 mg/Wipe	0.100	90%	50-150	B15E430	05/28/15	05/28/15	NWTPH-HCID	
22_13Wipe: W15E194-10									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%					
2-Fluorobiphenyl	0.0878 mg/Wipe	0.100	88%	50-150	B15E430	05/28/15	05/28/15	NWTPH-HCID	
22_14Wipe: W15E194-11									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	-		-			
2-Fluorobiphenyl	0.0885 mg/Wipe	0.100		-	B15E430	05/28/15	05/28/15	NWTPH-HCID	
22_15W: W15E194-12									

Reported: 06/17/15 13:47

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Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Analyte	Result Units	MRL	MDL	. Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Fuels									
Hydrocarbon Scan by GC-FID									
22_15W : W15E194-12									
Gasoline	ND mg/L	0.26		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	
Diesel	DET mg/L	0.53		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Lube oil	DET mg/L	0.53		1	B15F001	06/01/15	06/01/15	NWTPH-HCID	F0a, F8
Surrogate	Result	Expected	%Rec	Limits(%					
2-Fluorobiphenyl	0.0775 mg/L	0.105	74%	50-150	B15F001	06/01/15	06/01/15	NWTPH-HCID	
22_13W : W15E194-13									
Gasoline	ND mg/L	0.27		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Diesel	DET mg/L	0.53		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	F0
Lube oil	ND mg/L	0.53		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0958 mg/L	0.106	90%	50-150	B15F057	06/03/15	06/04/15	NWTPH-HCID	
22_14 : W15E194-14									
Gasoline	ND mg/kg dry	35		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Diesel	ND mg/kg dry	88		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Lube oil	ND mg/kg dry	176		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	14.2 mg/kg dry	17.6	81%	50-150	B15E420	05/28/15	05/28/15	NWTPH-HCID	
22_16 : W15E194-15									
Gasoline	ND mg/kg dry	31		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Diesel	DET mg/kg dry	77		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Lube oil	DET mg/kg dry	154		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	15.5 mg/kg dry	15.4	100%	50-150	B15E420	05/28/15	05/28/15	NWTPH-HCID	
22_17Wipe: W15E194-16									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0928 mg/Wipe	0.100	93%	50-150	B15E430	05/28/15	05/28/15	NWTPH-HCID	
22_18 : W15E194-17									
Gasoline	ND mg/kg dry	22		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Diesel	ND mg/kg dry	56		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Lube oil	ND mg/kg dry	112		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	=		00/20/10	00,20,10		
2-Fluorobiphenyl	9.33 mg/kg dry	11.2			B15E420	05/28/15	05/28/15	NWTPH-HCID	
22 19 : W15E194-18									
Gasoline	ND mg/kg dry	21		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Diesel	ND mg/kg dry	52		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Lube oil	ND mg/kg dry	105		1	B15E420	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec			30/20/10	00/20/10		
2-Fluorobiphenyl	9.80 mg/kg dry	10.5		50-150	B15E420	05/28/15	05/28/15	NWTPH-HCID	

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Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Fuels									
Hydrocarbon Scan by GC-FID									
22 20Wipe : W15E194-19									
Gasoline*	DET mg/Wipe	1		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	F4
Lube oil*	DET mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	F2
Diesel*	DET mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	F0b
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.00 mg/Wipe	0.100	%	50-150	B15E430	05/28/15	05/28/15	NWTPH-HCID	F6
22 21W : W15E194-20									
— Gasoline	DET mg/L	0.29		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	F4
Diesel	DET mg/L	0.58		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Lube oil	DET mg/L	0.58		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	F2
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.00 mg/L	0.116	%	50-150	B15F057	06/03/15	06/04/15	NWTPH-HCID	F6
22 22W : W15E194-21									
Gasoline	ND mg/L	0.50		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Diesel	DET mg/L	1.00		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Lube oil	DET mg/L	1.00		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0982 mg/L	0.200	49%	50-150	B15F057	06/03/15	06/04/15	NWTPH-HCID	SU1
22_23Wipe : W15E194-22									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430	05/28/15	05/28/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.100 mg/Wipe	0.100	100%	50-150	B15E430	05/28/15	05/28/15	NWTPH-HCID	

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Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Analyte	Result Units	MRL	MDL	Dil. Batch	Prepared	Analyzed Method	Qualifier

Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Semivolatile Organics - S	IM								
Polynuclear Aromatics & Phthala	ates by GCMS-SIM								
22_8W : W15E194-02									
Acenaphthene	0.83 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	ND ug/L	0.20	0.20	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	0.17 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	0.010 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene	0.013 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthracene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	0.053 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene	2.2 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalene	0.11 ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND ug/L	0.40	0.40	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Phenanthrene	2.1 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene	0.10 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	Result	Expected	%Rec I	Limits(%	6)				
2-Methylnaphthalene-d10 Fluoranthene-d10	0.25 ug/L 0.25 ug/L	0.229 0.229			B15E414 B15E414		06/01/15 06/01/15	EPA 8270-SIM EPA 8270-SIM	
22_9W : W15E194-03									
Acenaphthene	1.1 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	ND ug/L	0.22	0.22	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	0.21 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	0.021 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene	0.011 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	0.014 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene	0.028 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthracene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	0.085 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene	2.7 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalene	0.18 ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND ug/L	0.40	0.40	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Phenanthrene	2.7 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene	0.16 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	Result	Expected	%Rec I	Limits(%	6)				
2-Methylnaphthalene-d10	0.25 ug/L	0.229	111%	60.4-153	B15E414	05/28/15	06/01/15	EPA 8270-SIM	

Reported: 06/17/15 13:47

Fluoranthene-d10

Jennifer Shackelford

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115% 69-149 B15E414 05/28/15

0.26 ug/L

0.229

06/01/15 EPA 8270-SIM





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Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Semivolatile Organics - S	IM								
Polynuclear Aromatics & Phthal	ates by GCMS-SIM								
22 4W : W15E194-04									
Acenaphthene	1.0 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	ND ug/L	0.20	0.20	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	0.19 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	0.013 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene	0.014 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthracene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	0.058 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene	2.5 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalene	0.16 ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND ug/L	0.40	0.40	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Phenanthrene	2.4 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene	0.11 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	Result	Expected				00/20/10	00.01.10	2.7.02.0 0	
2-Methylnaphthalene-d10	0.27 ug/L	0.229		•	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10	0.24 ug/L	0.229	103% 6	9-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
22_5W: W15E194-05									
Acenaphthene	ND ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	ND ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	ND ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthracene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene	0.025 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Phenanthrene	ND ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
***************************************		3.0=0	0=0	•					

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Fluoranthene-d10

2-Methylnaphthalene-d10

Pyrene

Surrogate

Jennifer Shackelford

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05/28/15

06/01/15

EPA 8270-SIM

06/01/15 EPA 8270-SIM

06/01/15 EPA 8270-SIM

ND ug/L

0.23 ug/L

0.23 ug/L

Result

0.010

0.229

0.229

0.010

Expected %Rec Limits(%)

B15E414

100% 60.4-153 B15E414 05/28/15

103% 69-149 B15E414 05/28/15





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Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifie
Semivolatile Organics - S	IM								
Polynuclear Aromatics & Phthal	ates by GCMS-SIM								
22 10W : W15E194-06									
Acenaphthene	1.1 ug/L	0.020	0.020) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	ND ug/L	0.24	0.24	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	0.29 ug/L	0.020	0.020) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	0.19 ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene	0.13 ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	0.15 ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	0.11 ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	0.031 ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene	0.26 ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthracene	0.030 ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	0.51 ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene	2.4 ug/L	0.020	0.020) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	0.054 ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalene	0.19 ug/L	0.040	0.040) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	ND ug/L	0.040	0.040) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND ug/L	0.40	0.40	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene	0.91 ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	Result	Expected	d %Rec	Limits(%	6)				
2-Methylnaphthalene-d10	0.29 ug/L	0.229	125%	60.4-153	3 B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10	0.21 ug/L	0.229	91%	69-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
22 10W: W15E194-06RE1									
Phenanthrene	3.4 ug/L	0.10	0.10	5	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
FDBLANK : W15E194-07									
Acenaphthene	ND ug/L	0.020	0.020) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	ND ug/L	0.020	0.020		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	ND ug/L	0.020	0.020		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	ND ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene	ND ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	ND ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	ND ug/L	0.010	0.010		B15E414		06/01/15	EPA 8270-SIM	
Donizo(g,n,n)por yrono	ND ug/L	0.010	0.010		5102-14	33/20/10	00/01/10	=======================================	

0.010

0.010

0.010

0.010

0.020

0.010

0.040

0.040

0.040

0.020

0.010

Expected %Rec Limits(%)

1

1

1

0.010

0.010

0.010

0.010

0.020

0.010

0.040

0.040

0.040

0.020

0.010

ND ug/L

Result

Reported: 06/17/15 13:47

Benzo(k)fluoranthene

Dibenzo(a,h)anthracene

Indeno(1,2,3-cd)pyrene

1-Methylnaphthalene

2-Methylnaphthalene

Chrysene

Fluorene

Fluoranthene

Naphthalene

Phenanthrene

Pyrene

Surrogate

Jennifer Shackelford

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B15E414 05/28/15

05/28/15

05/28/15

B15E414

B15E414

06/01/15

06/01/15

06/01/15

06/01/15

06/01/15

06/01/15

06/01/15

06/01/15

06/01/15

06/01/15

06/01/15

EPA 8270-SIM





6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Analyte Result Units MRL MDL Dil. Batch Prepared Analyzed Method Qualifier

Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

FDBLANK : W15E194-07	5			0/-		<i>,</i> ,				
Surrogate 2-Methylnaphthalene-d10	Result	ug/L	Expected 0.229		•	6) 3 B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10		ug/L ug/L	0.229		69-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
22_15W: W15E194-12										
Acenaphthene	0.82	ug/L	0.020	0.020) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	ND	ug/L	0.20	0.20	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	0.14	ug/L	0.020	0.020) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	0.063	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene	0.090	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	0.13	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	0.090	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	0.044	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene	0.097	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthracene	0.020	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	0.15	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene	1.8	ug/L	0.020	0.020) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	0.070	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalene	0.14	ug/L	0.040	0.040) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	ND	ug/L	0.040	0.040) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND	ug/L	0.40	0.40	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Phenanthrene	1.2	ug/L	0.020	0.020) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene	0.21	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	Result		Expected	%Rec	Limits(%	6)				
2-Methylnaphthalene-d10		ug/L	0.229			B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10	0.23	ug/L	0.229	100%	69-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
22_13W : W15E194-13										
Acenaphthene	0.90	ug/L	0.020	0.020) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	ND	ug/L	0.20	0.20	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	0.026	ug/L	0.020	0.020) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	ND	ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene	ND	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	ND	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	ND	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	ND	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene	ND	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthracene	ND	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	0.016	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene	1.6	ug/L	0.020	0.020) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalene	0.18	ug/L	0.040	0.040) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	ND	ug/L	0.080	0.080) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND	ug/L	0.80	0.80	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	

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Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifie
Semivolatile Organics - SI									
Polynuclear Aromatics & Phthala									
22_13W : W15E194-13									
Phenanthrene	0.16 ug/L	0.020	0.020) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene	0.043 ug/L	0.010	0.010) 1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	Result	Expected	d %Rec	Limits(%	5)				
2-Methylnaphthalene-d10	0.34 ug/L	0.229	148%	60.4-153	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10	0.24 ug/L	0.229	104%	69-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
22_21W : W15E194-20RE1									
Acenaphthene	8.4 ug/L	0.10	0.10	5	B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Acenaphthylene	ND ug/L	2.5	2.5	5	B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Anthracene	1.5 ug/L	0.10	0.10	5	B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Benzo(a)anthracene	0.50 ug/L	0.050	0.050		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Benzo(a)pyrene	0.32 ug/L	0.050	0.050		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Benzo(b)fluoranthene	0.34 ug/L	0.050	0.050		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	0.27 ug/L	0.050	0.050		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Benzo(k)fluoranthene	0.12 ug/L	0.050	0.050		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Chrysene	0.73 ug/L	0.050	0.050		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Dibenzo(a,h)anthracene	0.080 ug/L	0.050	0.050		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Fluoranthene	1.6 ug/L	0.050	0.050		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	0.14 ug/L	0.050	0.050		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
· · · · · · ·	-	2.2	2.2	, 5 5	B15E414	05/28/15	06/02/15	EPA 8270-SIM	
1-Methylnaphthalene	ND ug/L	2.2	2.0	5			06/02/15		
2-Methylnaphthalene	ND ug/L				B15E414	05/28/15		EPA 8270-SIM	
Naphthalene	ND ug/L	4.0	4.0	5	B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Pyrene	2.8 ug/L Result	0.050	0.050		B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Surrogate 2-Methylnaphthalene-d10	0.30 ug/L	Expected 0.229		Limits(%	b) B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Fluoranthene-d10	0.24 ug/L	0.229		69-149	B15E414	05/28/15	06/02/15	EPA 8270-SIM	
	-5								
22_21W : W15E194-20RE2									
Fluorene	21 ug/L	0.50	0.50	25	B15E414	05/28/15	06/02/15	EPA 8270-SIM	
Phenanthrene	29 ug/L	0.50	0.50	25	B15E414	05/28/15	06/02/15	EPA 8270-SIM	
22_22W : W15E194-21									
Acenaphthene	0.56 ug/L	0.040	0.040) 2	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	0.17 ug/L	0.040	0.040) 2	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	0.20 ug/L	0.040	0.040) 2	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	0.89 ug/L	0.020	0.020		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene	1.1 ug/L	0.020	0.020		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	1.6 ug/L	0.020	0.020		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	1.3 ug/L	0.020	0.020		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	0.88 ug/L	0.020	0.020		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene	1.4 ug/L	0.020	0.020		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthracene		0.020	0.020		B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	0.54 ug/L	0.020	0.020			05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	2.0 ug/L	0.020	0.020		B15E414	05/28/15	06/01/15	EPA 8270-SIM	

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Indeno(1,2,3-cd)pyrene

Fluorene

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06/01/15

06/01/15

EPA 8270-SIM

EPA 8270-SIM

B15E414 05/28/15

B15E414 05/28/15

0.85 ug/L

0.99 ug/L

0.040

0.020

0.040

0.020





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Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Semivolatile Organics - S	IM								
Polynuclear Aromatics & Phthala	ates by GCMS-SIM								
22 22W : W15E194-21									
1-Methylnaphthalene	2.1 ug/L	0.080	0.080	2	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	0.20 ug/L	0.080	0.080	2	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND ug/L	1.2	1.2	2	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Phenanthrene	1.3 ug/L	0.040	0.040	2	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene	2.1 ug/L	0.020	0.020	2	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Methylnaphthalene-d10	0.33 ug/L	0.229	146%	60.4-153	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10	0.15 ug/L	0.229	64%	69-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM	SU1

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Jennifer Shackelford, Laboratory Coordinator QA/QC





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Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Quality Control Report

General Chemistry - QC

Analyte	Result	Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Solids - Batch B15E432										
Duplicate (B15E432-DUP1)			Source: W15	<u> 194-01</u>						
Total solids	76.7 % V	V/W	0.01			77.5		1 (5)	05/28/15 :05/29/15	

Fuels - QC

Analyte	Result Units	MRL	Spike MDL Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Diesel/Oil Hydrocarbons by G	C-FID - Batch B15E430							
Blank (B15E430-BLK2)								F7
Diesel	ND mg/Wipe	1.2					05/28/15 :06/03/15	
Lube oil	ND mg/Wipe	2.5					05/28/15 :06/03/15	
Surrogate								
2-Fluorobiphenyl	0.0831 mg/Wipe		0.100		83% (50-150)		05/28/15 :06/03/15	
Diesel/Oil Hydrocarbons by G	C-FID - Batch B15F001							
Blank (B15F001-BLK2)								F7
Diesel	ND mg/L	0.062					06/01/15 :06/03/15	
Lube oil	ND mg/L	0.12					06/01/15 :06/03/15	
Surrogate								
2-Fluorobiphenyl	0.0668 mg/L		0.100		67% (50-150)		06/01/15 :06/03/15	
LCS (B15F001-BS2)								F7
Diesel	0.907 mg/L	0.062	1.00		91% (50-150)		06/01/15 :06/03/15	
Lube oil	0.673 mg/L	0.12	1.00		67% (50-150)		06/01/15 :06/03/15	
Surrogate								
2-Fluorobiphenyl	0.0764 mg/L		0.100		76% (50-150)		06/01/15 :06/03/15	
LCS Dup (B15F001-BSD2)								F7
Diesel	0.947 mg/L	0.062	1.00		95% (50-150) 4 (2	200)	06/01/15 :06/03/15	
Lube oil	0.765 mg/L	0.12	1.00		76% (50-150) 13	(200)	06/01/15 :06/03/15	
Surrogate								
2-Fluorobiphenyl	0.0807 mg/L		0.100		81% (50-150)		06/01/15 :06/03/15	
Diesel/Oil Hydrocarbons by G	C-FID - Batch B15F046							
Blank (B15F046-BLK1)								F7
Diesel	ND mg/kg wet	21					06/03/15 :06/03/15	

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Lube oil

Surrogate

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ND mg/kg wet

06/03/15 :06/03/15





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Project: **Portland Harbor** Client: Director's Office Work Order: **W15E194** Received: 05/27/15 15:51

Fuels - QC

Analyte	Result Units	MRL	Spike MDL Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
Diesel/Oil Hydrocarbons by GO	C-FID - Batch B15F046							
Blank (B15F046-BLK1)								F
Surrogate								
2-Fluorobiphenyl	14.0 mg/kg wet		16.7		84% (50-150)		06/03/15 :06/03/15	
LCS (B15F046-BS1)								F
Diesel	190 mg/kg wet	25	200		95% (50-150)		06/03/15 :06/03/15	
Lube oil	111 mg/kg wet	50	200		55% (50-150)		06/03/15 :06/03/15	
Surrogate								
2-Fluorobiphenyl	22.0 mg/kg wet		20.0		110% <i>(50-150)</i>		06/03/15 :06/03/15	
Duplicate (B15F046-DUP1)		Source: W15	E199-05					F
Diesel	ND mg/kg dry	32		ND		(50)	06/03/15 :06/03/15	
Lube oil	310 mg/kg dry	58		201		43 (50)	06/03/15 :06/03/15	
Surrogate								
2-Fluorobiphenyl	23.8 mg/kg dry		23.4		102% (50-150)		06/03/15 :06/03/15	
Diesel/Oil Hydrocarbons by GO	C-FID - Batch B15F057							
Blank (B15F057-BLK2)								F
Diesel	ND mg/L	0.12					06/03/15 :06/09/15	
Lube oil	ND mg/L	0.062					06/03/15 :06/09/15	
Surrogate								
2-Fluorobiphenyl	0.0334 mg/L		0.0500		67% (50-150)		06/03/15 :06/09/15	
LCS (B15F057-BS2)								F
Diesel	0.304 mg/L	0.031	0.500		61% <i>(50-150)</i>		06/03/15 :06/09/15	
Lube oil	0.403 mg/L	0.062	0.500		81% (50-150)		06/03/15 :06/09/15	
Surrogate								
2-Fluorobiphenyl	0.0324 mg/L		0.0500		65% <i>(50-150)</i>		06/03/15 :06/09/15	
LCS Dup (B15F057-BSD2)								F
Diesel	0.303 mg/L	0.031	0.500		61% <i>(50-150)</i>	0.2 (200)	06/03/15 :06/09/15	
Lube oil	0.384 mg/L	0.062	0.500		77% (50-150)	5 (200)	06/03/15 :06/09/15	
Surrogate								
2-Fluorobiphenyl	0.0346 mg/L		0.0500		69% (50-150)		06/03/15 :06/09/15	
Hydrocarbon Scan by GC-FID	- Batch B15E420							
Blank (B15E420-BLK1)								
Gasoline	ND mg/kg wet	18					05/28/15 :05/28/15	
Diesel	ND mg/kg wet	45					05/28/15 :05/28/15	
Lube oil	ND mg/kg wet	91					05/28/15 :05/28/15	
Surrogate								
2-Fluorobiphenyl	8.65 mg/kg wet		9.09		95% (50-150)		05/28/15 :05/28/15	
Duplicate (B15E420-DUP1)		Source: W15	E194-14					

Reported: 06/17/15 13:47





6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: **Portland Harbor** Client: Director's Office Work Order: **W15E194** Received: 05/27/15 15:51

Fuels - QC

Analyte	Result Units	MRL	Spike MDL Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
Hydrocarbon Scan by GC-FID	- Batch B15E420							
Duplicate (B15E420-DUP1)		Source: W15	E194-14					
Gasoline	ND mg/kg dry	38		ND			05/28/15 :05/28/15	
Diesel	ND mg/kg dry	95		ND			05/28/15 :05/28/15	
Lube oil	ND mg/kg dry	190		ND			05/28/15 :05/28/15	
Surrogate								
2-Fluorobiphenyl	17.1 mg/kg dry		19.0		90% (50-150)		05/28/15 :05/28/15	
Hydrocarbon Scan by GC-FID	- Batch B15E430							
Blank (B15E430-BLK1)								
Gasoline	ND mg/Wipe	1					05/28/15 :05/28/15	
Lube oil	ND mg/Wipe	2					05/28/15 :05/28/15	
Diesel	ND mg/Wipe	2					05/28/15 :05/28/15	
Surrogate								
2-Fluorobiphenyl	0.0867 mg/Wipe		0.100		87% (50-150)		05/28/15 :05/28/15	
Hydrocarbon Scan by GC-FID	- Batch B15F001							
Blank (B15F001-BLK1)								
Gasoline	ND mg/L	0.25					06/01/15 :06/01/15	
Diesel	ND mg/L	0.50					06/01/15 :06/01/15	
Lube oil	ND mg/L	0.50					06/01/15 :06/01/15	
Surrogate								
2-Fluorobiphenyl	0.0672 mg/L		0.100		67% (50-150)		06/01/15 :06/01/15	
LCS (B15F001-BS1)								
Gasoline	DET mg/L	0.25	0.400		74% (50-150)		06/01/15 :06/01/15	
Diesel	DET mg/L	0.50	1.00		91% (50-150)		06/01/15 :06/01/15	
Lube oil	DET mg/L	0.50	1.00		83% (50-150)		06/01/15 :06/01/15	
Surrogate								
2-Fluorobiphenyl	0.0692 mg/L		0.100		69% (50-150)		06/01/15 :06/01/15	
LCS Dup (B15F001-BSD1)								
Gasoline	DET mg/L	0.25	0.400		79% (50-150)		06/01/15 :06/01/15	
Diesel	DET mg/L	0.50	1.00		95% (50-150)		06/01/15 :06/01/15	
Lube oil	DET mg/L	0.50	1.00		85% (50-150)		06/01/15 :06/01/15	
Surrogate								
2-Fluorobiphenyl	0.0736 mg/L		0.100		74% (50-150)		06/01/15 :06/01/15	
Hydrocarbon Scan by GC-FID	- Batch B15F057							
Blank (B15F057-BLK1)								
Gasoline	ND mg/L	0.12					06/03/15 :06/04/15	
Diesel	ND mg/L	0.12					06/03/15 :06/04/15	
	a	0.20						

Reported: 06/17/15 13:47

Jennifer Shackelford





6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Fuels - QC

Austra	Donald Haite	MDI			urce %Rec	RPD	Prepared:	0!!!!
Analyte	Result Units	MRL	MDL L	evel Re	sult <i>(Limit</i> s)	(Limit)	Analyzed	Qualifier
Hydrocarbon Scan by GC-F	FID - Batch B15F057							
Blank (B15F057-BLK1)								
Surrogate								
2-Fluorobiphenyl	0.0333 mg/L		0.	0500	67% (50-150)		06/03/15 :06/04/15	
LCS (B15F057-BS1)								
Gasoline	DET mg/L	0.06	0.	200	42% (50-150)		06/03/15 :06/04/15	
Diesel	DET mg/L	0.25	0	500	66% (50-150)		06/03/15 :06/04/15	
Lube oil	DET mg/L	0.25	0	500	66% (50-150)		06/03/15 :06/04/15	
Surrogate								
2-Fluorobiphenyl	0.0296 mg/L		0.	0500	59% (50-150)		06/03/15 :06/04/15	
LCS Dup (B15F057-BSD1)								
Gasoline	DET mg/L	0.05	0.	200	29% (50-150)		06/03/15 :06/04/15	
Diesel	DET mg/L	0.25	0.	500	66% (50-150)		06/03/15 :06/04/15	
Lube oil	DET mg/L	0.25	0.	500	61% (50-150)		06/03/15 :06/04/15	
Surrogate								
2-Fluorobiphenyl	0.0325 mg/L		0.	0500	65% <i>(50-150)</i>		06/03/15 :06/04/15	

Reported: 06/17/15 13:47

Jennifer Shackelford





6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Semivolatile Organics - SIM - QC

Analyte	Result Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
Polynuclear Aromatics & Phtl	halates by GCMS-SIM - B	atch B15E414							
Blank (B15E414-BLK1)									
Acenaphthene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Acenaphthylene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Anthracene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Benzo(a)anthracene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(a)pyrene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(b)fluoranthene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(g,h,i)perylene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(k)fluoranthene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Chrysene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Fluoranthene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Fluorene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Indeno(1,2,3-cd)pyrene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
1-Methylnaphthalene	ND ug/L	0.040	0.040					05/28/15 :06/01/15	
2-Methylnaphthalene	ND ug/L	0.040	0.040					05/28/15 :06/01/15	
Naphthalene	ND ug/L	0.040	0.040					05/28/15 :06/01/15	
Phenanthrene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Pyrene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Butyl benzyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Di-n-butyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Diethyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Dimethyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Di-n-octyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Bis(2-ethylhexyl) phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Surrogate									
2-Methylnaphthalene-d10	0.23 ug/L			0.229		102% (60.4-153		05/28/15 :06/01/15	
Fluoranthene-d10	0.25 ug/L			0.229		108% (69-149)		05/28/15 :06/01/15	
LCS (B15E414-BS1)									
Acenaphthene	0.112 ug/L	0.020	0.020	0.114		98% (58.8-155)		05/28/15 :06/01/15	
Acenaphthylene	0.115 ug/L	0.020	0.020	0.114		100% (64-155)		05/28/15 :06/01/15	
Anthracene	0.117 ug/L	0.020	0.020	0.114		102% (76.2-129		05/28/15 :06/01/15	
Benzo(a)anthracene	0.119 ug/L	0.010	0.010	0.114		104% (72.9-138		05/28/15 :06/01/15	
Benzo(a)pyrene	0.122 ug/L	0.010	0.010	0.114		106% (75.5-137		05/28/15 :06/01/15	
Benzo(b)fluoranthene	0.117 ug/L	0.010	0.010	0.114		102% (59.9-160		05/28/15 :06/01/15	
Benzo(g,h,i)perylene	0.106 ug/L	0.010	0.010	0.114		93% (70.1-134)		05/28/15 :06/01/15	
Benzo(k)fluoranthene	0.119 ug/L	0.010	0.010	0.114		104% (61.1-157		05/28/15 :06/01/15	
Chrysene	0.123 ug/L	0.010	0.010	0.114		108% (76.7-146		05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	0.117 ug/L	0.010	0.010	0.114		102% (63.9-140		05/28/15 :06/01/15	
Fluoranthene	0.119 ug/L	0.010	0.010	0.114		104% (77.5-134		05/28/15 :06/01/15	
Fluorene	0.118 ug/L	0.020	0.020	0.114		103% (61.2-157		05/28/15 :06/01/15	

Reported: 06/17/15 13:47

Jennifer Shackelford





6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: Portland Harbor Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
Polynuclear Aromatics & Phthala	tes by GCMS	S-SIM - Ba	atch B15E414							
_CS (B15E414-BS1)										
Indeno(1,2,3-cd)pyrene	0.112 ug/	L	0.010	0.010	0.114		98% (68.4-135)		05/28/15 :06/01/15	
1-Methylnaphthalene	0.131 ug/	L	0.040	0.040	0.114		114% (79.6-158		05/28/15 :06/01/15	
2-Methylnaphthalene	0.125 ug/	L	0.040	0.040	0.114		109% (76-161)		05/28/15 :06/01/15	
Naphthalene	0.117 ug/	L	0.040	0.040	0.114		103% (60.6-164		05/28/15 :06/01/15	
Phenanthrene	0.111 ug/	L	0.020	0.020	0.114		97% (77.4-140)		05/28/15 :06/01/15	
Pyrene	0.127 ug/	L	0.010	0.010	0.114		111% (81.1-141)		05/28/15 :06/01/15	
Surrogate										
2-Methylnaphthalene-d10	0.23 ug/	L			0.229		102% <i>(60.4-153</i>		05/28/15 :06/01/15	
Fluoranthene-d10	0.24 ug/	L			0.229		105% <i>(69-149)</i>		05/28/15 :06/01/15	
Matrix Spike (B15E414-MS1)			Source: W15	E194-05						
Acenaphthene	0.325 ug/	L	0.020	0.020	0.286	ND	114% <i>(58.8-155</i>		05/28/15 :06/01/15	
Acenaphthylene	0.319 ug/	L	0.020	0.020	0.286	ND	112% (64-155)		05/28/15 :06/01/15	
Anthracene	0.328 ug/	L	0.020	0.020	0.286	ND	115% (76.2-129		05/28/15 :06/01/15	
Benzo(a)anthracene	0.302 ug/	L	0.010	0.010	0.286	ND	106% (72.9-138		05/28/15 :06/01/15	
Benzo(a)pyrene	0.300 ug/	L	0.010	0.010	0.286	ND	105% (75.5-137		05/28/15 :06/01/15	
Benzo(b)fluoranthene	0.288 ug/	L	0.010	0.010	0.286	ND	101% (59.9-160		05/28/15 :06/01/15	
Benzo(g,h,i)perylene	0.259 ug/	L	0.010	0.010	0.286	ND	91% (70.1-134)		05/28/15 :06/01/15	
Benzo(k)fluoranthene	0.291 ug/	L	0.010	0.010	0.286	ND	102% (61.1-157		05/28/15 :06/01/15	
Chrysene	0.315 ug/	L	0.010	0.010	0.286	ND	110% (76.7-146		05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	0.282 ug/	L	0.010	0.010	0.286	ND	99% (63.9-140)		05/28/15 :06/01/15	
Fluoranthene	0.319 ug/	L	0.010	0.010	0.286	ND	112% (77.5-134		05/28/15 :06/01/15	
Fluorene	0.345 ug/	L	0.020	0.020	0.286	0.0251	112% (61.2-157		05/28/15 :06/01/15	
Indeno(1,2,3-cd)pyrene	0.274 ug/	L	0.010	0.010	0.286	ND	96% (68.4-135)		05/28/15 :06/01/15	
1-Methylnaphthalene	0.367 ug/	L	0.040	0.040	0.286	ND	129% (79.6-159		05/28/15 :06/01/15	
2-Methylnaphthalene	0.350 ug/	L	0.040	0.040	0.286	ND	123% (76-161)		05/28/15 :06/01/15	
Naphthalene	0.325 ug/	L	0.040	0.040	0.286	ND	114% (60.6-164		05/28/15 :06/01/15	
Phenanthrene	0.313 ug/	L	0.020	0.020	0.286	ND	109% (77.4-140		05/28/15 :06/01/15	
Pyrene	0.341 ug/	L	0.010	0.010	0.286	ND	119% (81.1-141		05/28/15 :06/01/15	
Surrogate										
2-Methylnaphthalene-d10	0.25 ug/	L			0.229		109% (60.4-153		05/28/15 :06/01/15	
Fluoranthene-d10	0.25 ug/	L			0.229		110% (69-149)		05/28/15 :06/01/15	
Matrix Spike Dup (B15E414-MSD1)			Source: W15	E194-05						
Acenaphthene	0.322 ug/	L	0.020	0.020	0.286	ND	113% <i>(58.8-155</i> 0.	7 (50)	05/28/15 :06/01/15	
Acenaphthylene	0.320 ug/	L	0.020	0.020	0.286	ND	112% (64-155) 0.:	2 (50)	05/28/15 :06/01/15	
Anthracene	0.324 ug/	L	0.020	0.020	0.286	ND	113% (76.2-129 1	(50)	05/28/15 :06/01/15	
Benzo(a)anthracene	0.310 ug/	L	0.010	0.010	0.286	ND	108% (72.9-138 3	05/28/15 :06/01/15		
Benzo(a)pyrene	0.310 ug/	L	0.010	0.010	0.286	ND	108% (75.5-137 3	(50)	05/28/15 :06/01/15	
Benzo(b)fluoranthene	0.293 ug/	L	0.010	0.010	0.286	ND	103% (59.9-160 2	(50)	05/28/15 :06/01/15	
Benzo(g,h,i)perylene	0.271 ug/	L	0.010	0.010	0.286	ND	95% (70.1-134) 4	(50)	05/28/15 :06/01/15	
Benzo(k)fluoranthene	0.303 ug/	L	0.010	0.010	0.286	ND	106% (61.1-157 4	(50)	05/28/15 :06/01/15	

Reported: 06/17/15 13:47

Jennifer Shackelford





6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 **ORELAP Certification ID 4023**

Project: **Portland Harbor** Client: Director's Office Work Order: W15E194 Received: 05/27/15 15:51

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Polynuclear Aromatics & Phthalate	s by GCMS	S-SIM - E	Batch B15E414							
Matrix Spike Dup (B15E414-MSD1)			Source: W15E	194-05						
Chrysene	0.324 ug/	L	0.010	0.010	0.286	ND	113% (76.7-146	3 (50)	05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	0.297 ug/	L	0.010	0.010	0.286	ND	104% (63.9-140	5 (50)	05/28/15 :06/01/15	
Fluoranthene	0.317 ug/	L	0.010	0.010	0.286	ND	111% (77.5-134)	0.7 (50)	05/28/15 :06/01/15	
Fluorene	0.351 ug/	L	0.020	0.020	0.286	0.0251	114% (61.2-157	2 (50)	05/28/15 :06/01/15	
Indeno(1,2,3-cd)pyrene	0.287 ug/	L	0.010	0.010	0.286	ND	101% (68.4-135	5 (50)	05/28/15 :06/01/15	
1-Methylnaphthalene	0.364 ug/	L	0.040	0.040	0.286	ND	127% (79.6-159	0.9 (50)	05/28/15 :06/01/15	
2-Methylnaphthalene	0.350 ug/	L	0.040	0.040	0.286	ND	122% (76-161)	0.2 (50)	05/28/15 :06/01/15	
Naphthalene	0.320 ug/	L	0.040	0.040	0.286	ND	112% (60.6-164	2 (50)	05/28/15 :06/01/15	
Phenanthrene	0.315 ug/	L	0.020	0.020	0.286	ND	110% (77.4-140	0.9 (50)	05/28/15 :06/01/15	
Pyrene	0.337 ug/	L	0.010	0.010	0.286	ND	118% (81.1-141	1 (50)	05/28/15 :06/01/15	
Surrogate										
2-Methylnaphthalene-d10	0.25 ug/	L			0.229		108% (60.4-153		05/28/15 :06/01/15	
Fluoranthene-d10	0.25 ug/	L			0.229		108% <i>(69-149)</i>		05/28/15 :06/01/15	

Qualifiers

F0	Fuel pattern most closely resembles transformer oil.												
F0a	Result most closely resembles non-Aroclor transformer oil.												
F0b	Results resembles most closely non-PCB transformer oil.												
F2	Result for heavy oil is primarily due to overlap from diesel-range	hydrocarbon	S.										
F4	Result for gasoline is primarily overlap from diesel-range hydroca	arbons.											
F6	Surrogate recovery could not be determined due to the high concentration of hydrocarbons in the sample.												
F7	This sample underwent silica gel clean-up. Hydrocarbons quantified as Diesel and Lube Oil appear to be a single petroleum product that is heavier than Diesel #2 and lighter than the reference Lube Oil.												
F8													
SU1	Recovery for one or more surrogate compounds was outside the estimates.	acceptance	range (low). Sample results may be low										
SU5	Surrogate recovery could not be determined due to required dilu	tion of the sa	mple extract.										
	Definit	ions											
DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit										
MRL	Method Reporting Limit	MDL	Method Detection Limit										
NR	Not Reportable	dry	Sample results reported on a dry weight basis										
% Rec.	Percent Recovery	RPD	Relative Percent Difference										
*	This analyte is not certified under NELAP												

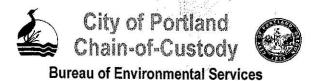
Reported: 06/17/15 13:47

Jennifer Shackelford

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Jennifer Shackelford, Laboratory Coordinator QA/QC

Water Pollution Control Laboratory 6543 N. Burlington Ave. Portland, Oregon 97203-4552 Sample Custodian: (503) 823-5696 General Lab: (503) 823-5681



Date: 5/27/5

Work Order #: (MSE)94

Collected By: MJS, WCR, TFG, PHA

Client Name: **Director's Office** Project Name: **Portland Harbor**

										F	Requ	ıest	ed A	nal	yse	es	- 10 and		877		-
	Special Instructions:	12																			
jr.	N. M. M. M. M.	Run NWTPH-Dx and NWTPH-Gx if detected					vel)		1000						7			Conductivity (umhos/cm)	rho.	□ Standard	d-Time Request: (10 business days)
quin	Run NW I PH-Dx and						W-Le							1				Vivity	V 3	 □ Rush (5 b) □ Other: 	usiness days)
Lab Number	Location ID	Sample Date	Sample Time	<u>G</u> rab or <u>C</u> omp	Sample Matrix	NWTPH-HCID	PAHs (low-Level)											Conduct	Meter:	# of Containers	Remarks
01	22_8	5/27/2015	0929	С	Sed	•														1	AAM079 (OF22) Sediment Composite
2	22_8W	5/27/2015	0930	G	Water	•	•											30	9	2	AAM079 (OF22) Dry-weather Flow
3	22_9W	5/27/2015	1004	G	Water	•	•													2	AAM077-E 60" Dry-weather Flow
4	22_4W	5/27/2015	1009	G	Water	•	•													2	AAM077-W 48" Dry-weather Flow
5	22_5W	5/27/2015	1013	G	Water	•	•													2	AAM077-SW 30" Dry-weather Flow
6	22_10W	5/27/2015	1049	G	Water	•	•											32	ے	2	AAM080 Surface Sheen
7	FDBLANK	5/27/2015	1121	G	Water	•	•													2	Field Decon Blank of Bowl and Bailer
8	22_11	5/27/2015	1105	ر (قر مره)	als PSed	•														1	AAM080-SW Inline Sediment
9	22_12Wipe	5/27/2015	1140	G	Wipe	•			-											1	AAM075-S Wipe under lateral
14	22_13Wipe	5/27/2015	1147	G	Wipe	•														1	AAM075-N Wipe from end of pipe
1100	22_13Wipe linguished By: ature: M. H. Bu	Min	Date:		Received By Signature	<u>ı:</u>	_ V	<u> </u>		Date:	ς		elinquis Inature:	hed E	By:		Date:		lecei ignatu	ved By: re:	Date:
	ted Name: Matt Sull		Time:	551	Printed Name:	الما	Int	324	ren	Time:		Pri	nted Name	9:		- 17	Time:	Pı	rinted	Name:	Time:
ľ	Portland Harbor - Ba	sin 22 Petroleum	Sheen COC	#1 (5-27-15)				J												Pag	ge \ of 3

Water Pollution Control Laboratory 6543 N. Burlington Ave. Portland, Oregon 97203-4552 Sample Custodian: (503) 823-5696 General Lab: (503) 823-5681

Director's Office

Client Name:



Date: <u>5/27/15</u>

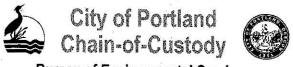
Work Order #: WSE 194

Collected By: MJS, WCR, JFG, PHA

Dureau of Environmental Service

101	Project Name:	Portland	l Harbor					-																
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er	Basin 22 Petroleum S		_	ır.	12 28	0,	evel)													*	Conductivity (umhos/cm) Meter: ComboS	ľ	dard (I-Time Request: (10 business days) usiness days)
quin	Ruti NWTFH-DX and	NWIFH-GX	ii detectet	u.		皇	OW-L														E S	Other		asiness days
Lab Number	Location ID	Sample Date	Sample Time	<u>G</u> rab or <u>C</u> omp	Sample Matrix	NWTPH-HCID ¹	PAHs (low-Level)														Conduc Meter:	# of Containe	ers	Remarks
\$ 1	22_14Wipe	5/27/2015	1153	G	Wipe	•															V	1		AAM075-Shelf Wipe from Shelf
12	22_15W	5/27/2015	1159	G	Water	•	•														324	2		AAM075 - DS Dry-weather Flow
13	22_13W	5/27/2015	1201	G	Water	•	•		Š												679	2		AAM075-N Dry-weather Flow
14	22_14	5/27/2015	1209	0 1	Sed	•															•	1		AAM075-Shelf Inline Sediment
15	22_16	5/27/2015	1212	C	Sed	•																1		AAM075-US Inline Sediment
16	22_17Wipe	5/27/2015	1249	G	Wipe	•															5000000	1		AAM076-Sanitary Line Wipe from bottom
17	22_18	5/27/2015	1253	C	Sed	•												,				1		AAM076-DS Inline Sediment
18	22_19	5/27/2015	1315	C	Sed	•																		AAM086-DS Inline Sediment
19	22_20Wipe	5/27/2015	1322	G	Wipe	•																1		AAM086-S Wipe on US side of Lat
20	D 22_21W	5/27/2015	1327	G	Water	•	•									-					482	2	-	AAM086-S Flow on DS side of Lat
5140 214 35	Page 22_21W nquished By: ture: May Say ad Name: h = + + 5 t	lin	Date:	127/15	Received B Signature	y: 7 7	Þ	_			8	Date:	ſ	Signa		ed By	! 181		Date		Signa	eived By:		Date:
		Illivan) {	551		bel	h t	30,40	<u>161</u>	21		Time:1 LSS f		Printe	d Name:				Time		Print	ed Name:		Time:
- 1	Portland Harbor - Bas	sin 22 Petroleum	Sheen COC	#2 (5-27-15)				•				3				34							Pa	ge <u>Z</u> of <u>3</u>

Water Pollution Control Laboratory 6543 N. Burlington Ave. Portland, Oregon 97203-4552 Sample Custodian: (503) 823-5696 General Lab: (503) 823-5681



Date: 5/27/15

Work Order #: WSE194

Collected By: MJS, WCR, JFG, PHA

Bureau of Environmental Services

	Client Name:	Director	's Office	<u> </u>														 			-		
Ŋ	Project Name:	Portland	l Harbor																				
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	Special Instructions: Basin 22 Petroleum S	heen Investi	gation		10															New Year	1	ound	I-Time Request:
Lab Number	¹ Run NWTPH-Dx and	NWTPH-Gx	if detected	đ		-HCID1	PAHs (iow-Level)							13						Conductivity (umhos/cm)	Stand	h (5 bu	(10 business days) usiness days)
Lab N	Location ID	Sample Date	Sample Time	<u>G</u> rab or <u>C</u> omp	Sample Matrix	NWTPH-HCID ¹	PAHs (i													Conduc Meter:	# of Contains		Remarks
3 1	22_22W	5/27/2015	1345	G	Water	•	•													187	а		APA016 Surface Sheen
22	22_23Wipe	5/27/2015	1351	G	Wipe	•													***		1		APA016 Wipe under lat from NE
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	of Name: 25 M = ++ 5alli	Van	Time:	31	Printed Name:	The	Bet	htd	gra	7	Time: (5)	1		Printed	Name:			Tim	ne:	Printe	ed Name:		Time:
-1	Portland Harbor - Ba	sin 22 Petroleum	Sheen COC	#3 (5-27-15)			9		,	8 8									***************************************			Pag	ge3_ of3_

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3	Н	CI (1:1) to p	H <2		15006	078	-			2.0mL/100					46
4	Н	Cl (1:1) to p	H 2-3	· · · · · · · · · · · · · · · · · · ·	10 224 g	* 1	Fo	r TOC:	2-5 dr	ops/250n	nL			32	
5	Na	OH (pellets	s) to pH >1	2		F 7.780	4-1	10 pelle	s/500	mL; 8-20	pellets/10	000mL			
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Investigation Day Two May 28, 2015



55 SW Yamhill Street, Suite 400 Portland, OR 97204 P: 503.239.8799 F: 503.239.8940 info@gsiwatersolutions.com www.qsiwatersolutions.com

Laboratory Data QA/QC Review Petroleum Sheen Investigation Outfall Basin 22

To: File

From: Andrew Davidson, GSI

Date: June 28, 2015

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated during a source control investigation sampling event conducted by the City of Portland (City). Three inline solids samples, five dry weather flow (DWF) grab samples, and five wipe samples were collected in Outfall Basin 22 on May 28, 2015 and submitted for analyses.

The laboratory analyses for these source control program samples were completed by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and included the following analyses:

BES WPCL

- o Total Solids SM 2540 G (Inline solids samples only)
- o Field Conductivity FO SOP 1.03a
- o Hydrocarbon Analysis NWTPH-HCID (NWTPH-Dx if detected)
- Polycyclic Aromatic Hydrocarbons (PAHs) EPA 8270-SIM (DWF samples only)

The WPCL summary report for all analyses associated with this sampling event is attached for review.

The following QA/QC review of the analytical data is based on the available documentation provided by WPCL. The QA/QC review consisted of reviewing the following elements from the laboratory report, if applicable and available:

- Chain-of-custody for completeness and continuous custody.
- Analysis conducted within holding times.
- Chemicals of interest detected in method blanks and/or field decontamination blanks.

- Internal standard recoveries within laboratory control limits.
- Surrogate recoveries within laboratory control limits.
- Matrix spike/matrix spike duplicate (MS/MSD) sample results within laboratory control limits.
- Laboratory control/duplicate laboratory control (LC/DLC) sample recoveries within laboratory control limits.
- Relative percent differences (RPDs) for laboratory duplicate samples within laboratory control limits.

The results of the QA/QC review of the subcontracted laboratory reports are presented below.

Chain-of-Custody

The chain-of-custody forms showed continuous custody of the samples. The chain-of-custody procedures appear to have been adequate indicating that sample integrity was maintained throughout the sample collection and delivery process.

Analysis Holding Times

The samples were extracted and analyzed within the recommended method-specific holding times.

Method Blanks

Method blanks were processed during the hydrocarbon scan analysis (NWTPH-HCID) and the analysis of diesel/oil hydrocarbons (NWTPH-Dx) for wipe, DWF, and inline solids samples. Blank samples were free of target analytes with one exception:

• WPCL reports that lube oil was detected in the method blank associated with the hydrocarbon scan of DWF samples at a concentration greater than one half of the reporting level, but less than the reporting level. Lube oil was not detected in any of the associated DWF samples, and the data are not further qualified.

One method blank sample was processed during the analysis of PAHs. No analytes were detected in the method blank sample.

Surrogate Recoveries

Surrogate recoveries were processed during the laboratory analyses of hydrocarbons and PAHs. Surrogate recoveries were within control limits with the following exception:

 High concentrations of hydrocarbons in sample W15E199-08 prevented determination of surrogate recoveries during the initial hydrocarbon scan (NWTPH-HCID). Despite the sample undergoing silica gel-cleanup, associated surrogate recoveries could not be determined during the diesel/oil analysis (NWTPH-Dx) due to high dilution (25X) of the sample extract. The associated result for diesel is qualified as an estimate and flagged "J" due to unacceptable surrogate recovery "SR"; that is there is a degree of uncertainty associated with the value due to the high dilution that prevented acceptable recovery of the surrogate compound 2-Fluorobiphenyl.

Matrix Spike/Matrix Spike Duplicate

MS/MSD samples were prepared using aliquots of DWF sample W15E194-05 and processed during the laboratory analysis of PAHs in DWF samples. MS/MSD recoveries and RPDs were within acceptance limits for all spiked analytes.

Laboratory Control Samples/Duplicate Laboratory Control Samples

LCS samples were processed during the analyses of hydrocarbons in DWF and inline solids samples and during the analyses of PAHs in DWF samples. DLC samples were processed during the analyses of hydrocarbons in DWF samples. All laboratory control sample recoveries and RPDs were within laboratory control limits.

Duplicate Samples

Duplicate samples were processed during the analyses of total solids and hydrocarbons (NWTPH-HCID and NWTPH-Dx) for inline solids samples. All RPDs were within acceptance criteria.

Additional Information

WPCL reports the following additional information regarding wipe, DWF, and inline solids samples:

- For samples where hydrocarbons were detected by the initial hydrocarbon scan (NWTPH-HCID), additional analyses NWTPH-Dx and NWTPH-Gx were to be run. WPCL reports that no VOAs were available for follow-up analysis of NWTPH-Gx on water samples; no extra jars were available for follow-up analysis of NWTPH-Gx on inline solids; no additional sample available for follow-up analysis of NWTPH-Gx on the wipe samples. Accordingly, only NWTPH-Dx analyses were conducted for the samples where hydrocarbons were detected by NWTPH-HCID.
- All samples analyzed by NWTPH-Dx underwent silica gel clean-up.
- WPCL reports that the fuel pattern in sample W15E199-01 most closely resembles transformer oil, and the fuel pattern in sample W15E199-08 most closely resembles non-PCB transformer oil.
- WPCL reports that during the initial hydrocarbon scan, results for gasoline and lube oil in sample W15E199-08 were primarily due to overlap from diesel-range hydrocarbons. These detections are qualified as estimates "J" in subsequent tables to indicate matrix interference "MI".
- WPCL qualifies that reported analytes for the hydrocarbon analyses of wipe samples (quantified in mg/Wipe) are not certified under the National Environmental Laboratory Accreditation Program (NELAP).



6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



June 17, 2015 Linda Scheffler

Director's Office

Work Order

Project

W15E199 Portland Harbor

Received 05/28/15 15:15

Enclosed are the results of analysis for the above work order. If you have questions concerning this report, please contact your project coordinator Peter Abrams at 503-823-5533.

Jennifer Shackelford

Laboratory Coordinator QA/QC

Tennifer Shackelford







6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 **ORELAP Certification ID 4023**

LABORATORY ANALYSIS REPORT

Project: **Portland Harbor**

Work Order: W15E199 5/28/15 15:15 Client: Director's Office Project Mgr: Linda Scheffler

Received: Submitted By: Field Operations

				Sample Col	lection Date	
Sample	Laboratory ID	Matrix	Туре	Start	End	Qualifier
22_24W	W15E199-01	Water	Grab	05/28/15 10:13	05/28/15 10:13	
22_25Wipe	W15E199-02	Wipe	Grab	05/28/15 10:18	05/28/15 10:18	
22_26Wipe	W15E199-03	Wipe	Grab	05/28/15 10:21	05/28/15 10:21	
22_27W	W15E199-04	Water	Grab	05/28/15 10:43	05/28/15 10:43	
22_28	W15E199-05	Sediment	Composite	05/28/15 10:50	05/28/15 10:50	
22_29W	W15E199-06	Water	Grab	05/28/15 10:56	05/28/15 10:56	
22_30Wipe	W15E199-07	Wipe	Grab	05/28/15 11:16	05/28/15 11:16	
22_31Wipe	W15E199-08	Wipe	Grab	05/28/15 11:19	05/28/15 11:19	
22_32W	W15E199-09	Water	Grab	05/28/15 11:48	05/28/15 11:48	
22_6W	W15E199-10	Water	Grab	05/28/15 12:09	05/28/15 12:09	
22_33	W15E199-11	Sediment	Composite	05/28/15 12:16	05/28/15 12:16	
22_34	W15E199-12	Sediment	Composite	05/28/15 14:08	05/28/15 14:08	
22_35Wipe	W15E199-13	Wipe	Grab	05/28/15 14:12	05/28/15 14:12	

Case Narrative

PAH/phthalates by 8270-SIM Analysis: Only PAH analysis was requested. Phthalates are not reported.

Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Field Parameters									
Field conductivity									
22_24W : W15E199-01 Conductivity*	254 umhos/cm			1	B15E440	05/28/15	05/28/15	FO SOP 1.03a	
22_27W : W15E199-04 Conductivity*	103 umhos/cm			1	B15E440	05/28/15	05/28/15	FO SOP 1.03a	
22_29W : W15E199-06 Conductivity*	184 umhos/cm			1	B15E440	05/28/15	05/28/15	FO SOP 1.03a	
22_32W : W15E199-09 Conductivity*	173 umhos/cm			1	B15E440	05/28/15	05/28/15	FO SOP 1.03a	
22 6W : W15E199-10									

Reported: 06/17/15 12:54

Jennifer Shackelford

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.





6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: **Portland Harbor** Client: Director's Office Work Order: **W15E199** Received: 05/28/15 15:15

Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifie
Field Parameters									
Field conductivity									
22_6W : W15E199-10 Conductivity*	194 umhos/cm			1	B15E440	05/28/15	05/28/15	FO SOP 1.03a	
General Chemistry									
Total Solids									
22_28 : W15E199-05 Total solids	73.0 % W/W	0.01			B15E448	05/29/15	05/30/15	SM 2540G	
22_33 : W15E199-11 Total solids	81.5 % W/W	0.01			B15E448	05/29/15	05/30/15	SM 2540G	
22_34: W15E199-12 Total solids	85.0 % W/W	0.01			B15E448	05/29/15	05/30/15	SM 2540G	

Reported: 06/17/15 12:54

Jennifer Shackelford

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6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: Portland Harbor Client: Director's Office Work Order: W15E199 Received: 05/28/15 15:15

Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Fuels									
Diesel/Oil Hydrocarbons by GC-F	ID								
22 24W : W15E199-01									F7
 Diesel	0.48 mg/L	0.068		1	B15F057	06/03/15	06/09/15	NWTPH-Dx	
Lube oil	1.4 mg/L	0.14		1	B15F057	06/03/15	06/09/15	NWTPH-Dx	
Surrogate	Result	Expected	%Rec	Limits(%	5)				
2-Fluorobiphenyl	0.0901 mg/L	0.109	83%	50-150	B15F057	06/03/15	06/09/15	NWTPH-Dx	
22_28 : W15E199-05									F7
Diesel	ND mg/kg dry	28		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	
Lube oil	200 mg/kg dry	56		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	
Surrogate	Result	Expected	%Rec	Limits(%	5)				
2-Fluorobiphenyl	22.1 mg/kg dry	22.4	99%	50-150	B15F046	06/03/15	06/03/15	NWTPH-Dx	
22_31Wipe: W15E199-08									F7
· Diesel*	420 mg/Wipe	31		25	B15E430	05/29/15	06/03/15	NWTPH-Dx	
Lube oil*	ND mg/Wipe	110		25	B15E430	05/29/15	06/03/15	NWTPH-Dx	
Surrogate	Result	Expected	%Rec	Limits(%	5)				
2-Fluorobiphenyl	0.00 mg/Wipe	0.100	%	50-150	B15E430	05/29/15	06/03/15	NWTPH-Dx	SU5
22_33 : W15E199-11									F7
Diesel	ND mg/kg dry	25		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	
Lube oil	130 mg/kg dry	51		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	
Surrogate	Result	Expected	%Rec	Limits(%	5)				
2-Fluorobiphenyl	20.9 mg/kg dry	20.3	103%	50-150	B15F046	06/03/15	06/03/15	NWTPH-Dx	
22_34 : W15E199-12									F7
Diesel	ND mg/kg dry	26		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	
Lube oil	190 mg/kg dry	47		1	B15F046	06/03/15	06/03/15	NWTPH-Dx	
Surrogate	Result	Expected	%Rec	Limits(%	5)				
2-Fluorobiphenyl	19.6 mg/kg dry	18.8	105%	50-150	B15F046	06/03/15	06/03/15	NWTPH-Dx	
Hydrocarbon Scan by GC-FID									
22_24W: W15E199-01									
Gasoline	ND mg/L	0.27		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Diesel	DET mg/L	0.54		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	F0a
Lube oil	DET mg/L	0.54		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	5)				
2-Fluorobiphenyl	0.0911 mg/L	0.109	84%	50-150	B15F057	06/03/15	06/04/15	NWTPH-HCID	
22_25Wipe: W15E199-02									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	5		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430		05/29/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	5)				
2-Fluorobiphenyl	0.0972 mg/Wipe	0.100	97%	50-150	B15E430	05/29/15	05/29/15	NWTPH-HCID	
22_26Wipe: W15E199-03									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	5		1	B15E430		05/29/15	NWTPH-HCID	

Reported: 06/17/15 12:54

Jennifer Shackelford





6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: Portland Harbor Client: Director's Office Work Order: W15E199 Received: 05/28/15 15:15

Analyte	Result Units	MRL	MDL	. Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Fuels									
Hydrocarbon Scan by GC-FID									
22_26Wipe: W15E199-03									
Diesel*	ND mg/Wipe	2		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0901 mg/Wipe	0.100	90%	50-150	B15E430	05/29/15	05/29/15	NWTPH-HCID	
22_27W : W15E199-04									
Gasoline	ND mg/L	0.27		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Diesel	ND mg/L	0.54		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Lube oil	ND mg/L	0.54		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0855 mg/L	0.109	79%	50-150	B15F057	06/03/15	06/04/15	NWTPH-HCID	
22_28 : W15E199-05									
Gasoline	ND mg/kg dry	24		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Diesel	ND mg/kg dry	60		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Lube oil	DET mg/kg dry	121		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	11.2 mg/kg dry	12.1	93%	50-150	B15E437	05/29/15	05/29/15	NWTPH-HCID	
22 29W : W15E199-06									
— Gasoline	ND mg/L	0.27		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Diesel	ND mg/L	0.54		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Lube oil	ND mg/L	0.54		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0924 mg/L	0.109	85%	50-150	B15F057	06/03/15	06/04/15	NWTPH-HCID	
22_30Wipe: W15E199-07									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	5		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%					
2-Fluorobiphenyl	0.0806 mg/Wipe	0.100	81%	50-150	B15E430	05/29/15	05/29/15	NWTPH-HCID	
22_31Wipe: W15E199-08									
Gasoline*	DET mg/Wipe	1		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	F4
Lube oil*	DET mg/Wipe	5		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	F2
Diesel*	DET mg/Wipe	2		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	F0b
Surrogate	Result	Expected	%Rec	Limits(%					
2-Fluorobiphenyl	0.00 mg/Wipe	0.100	%	50-150	B15E430	05/29/15	05/29/15	NWTPH-HCID	F6
22 32W : W15E199-09									
— Gasoline	ND mg/L	0.28		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Diesel	ND mg/L	0.57		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Lube oil	ND mg/L	0.57		1	B15F057	06/03/15	06/04/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec						
2-Fluorobiphenyl	0.0917 mg/L	0.114	81%	50-150	B15F057	06/03/15	06/04/15	NWTPH-HCID	
22_6W: W15E199-10									
Gasoline	ND mg/L	0.27		1	B15F126	06/08/15	06/08/15	NWTPH-HCID	
34001110	112 mg/L	U.Z.			3.07 120	30,00,10	33,30,10		

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Project: Portland Harbor Client: Director's Office Work Order: W15E199 Received: 05/28/15 15:15

Analyte	Result Units	MRL	MDL	_ Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Fuels									
Hydrocarbon Scan by GC-FID									
22 6W : W15E199-10									
 Diesel	ND mg/L	0.53		1	B15F126	06/08/15	06/08/15	NWTPH-HCID	
Lube oil	ND mg/L	0.53		1	B15F126	06/08/15	06/08/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0708 mg/L	0.106	67%	50-150	B15F126	06/08/15	06/08/15	NWTPH-HCID	
22_33 : W15E199-11									
Gasoline	ND mg/kg dry	19		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Diesel	ND mg/kg dry	48		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Lube oil	DET mg/kg dry	96		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	9.31 mg/kg dry	9.58	97%	50-150	B15E437	05/29/15	05/29/15	NWTPH-HCID	
22_34 : W15E199-12									
Gasoline	ND mg/kg dry	21		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Diesel	ND mg/kg dry	52		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Lube oil	DET mg/kg dry	104		1	B15E437	05/29/15	05/29/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	8.38 mg/kg dry	10.4	81%	50-150	B15E437	05/29/15	05/29/15	NWTPH-HCID	
22_35Wipe: W15E199-13									
Gasoline*	ND mg/Wipe	1		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Lube oil*	ND mg/Wipe	5		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Diesel*	ND mg/Wipe	2		1	B15E430	05/29/15	05/29/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	0.0842 mg/Wipe	0.100	84%	•	B15E430	05/29/15	05/29/15	NWTPH-HCID	

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Project: Portland Harbor Client: Director's Office Work Order: W15E199 Received: 05/28/15 15:15

Analyte Result Units MRL MDL Dil. Batch Prepared Analyzed Method Qualifier

· ······ y · ·									
emivolatile Organics - SI	M								
olynuclear Aromatics & Phthala	ates by GCMS-SIM								
22_24W : W15E199-01									
Acenaphthene	0.020 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	ND ug/L	0.060	0.060	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	0.10 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	0.037 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene	0.058 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	0.11 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	0.15 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	0.037 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene	0.071 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthracene	0.019 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	0.098 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene	ND ug/L	0.030	0.030	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	0.063 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Phenanthrene	0.043 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene	0.20 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	Result	Expected	d %Rec L	Limits(%	6)				
2-Methylnaphthalene-d10	0.24 ug/L	0.229			B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10	0.24 ug/L	0.229	105% 6	59-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
22_27W: W15E199-04									
Acenaphthene	0.12 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	ND ug/L	0.060	0.060	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	0.075 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	0.010 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthracene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene	0.26 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalene	0.051 ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND ug/L	0.080	0.080	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Phenanthrene	0.12 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	

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Fluoranthene-d10

2-Methylnaphthalene-d10

Pyrene

Surrogate

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06/01/15

06/01/15

06/01/15

EPA 8270-SIM

EPA 8270-SIM

EPA 8270-SIM

B15E414 05/28/15

0.010 ug/L

0.23 ug/L

0.22 ug/L

Result

0.010

0.229

0.229

0.010

Expected %Rec Limits(%)

1

99% 60.4-153 B15E414 05/28/15

97% 69-149 B15E414 05/28/15





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Project: Portland Harbor Client: Director's Office Work Order: W15E199 Received: 05/28/15 15:15

Analyte	Result Units	MRL	MDL	Dil. Batch	Prepared	Analyzed	Method	Qualifier
Semivolatile Organics - SIM								

emivolatile Organics - Sl	IM							
olynuclear Aromatics & Phthala								
22_29W : W15E199-06	•							
Acenaphthene	0.20 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Acenaphthylene	ND ug/L	0.060	0.060		B15E414	05/28/15	06/01/15	EPA 8270-SIM
Anthracene	0.12 ug/L	0.020	0.020		B15E414	05/28/15	06/01/15	EPA 8270-SIM
Benzo(a)anthracene	ND ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM
Benzo(a)pyrene	ND ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM
Benzo(b)fluoranthene	0.013 ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM
Benzo(g,h,i)perylene	ND ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM
Benzo(k)fluoranthene	ND ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM
Chrysene	ND ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM
Dibenzo(a,h)anthracene	ND ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM
Fluoranthene	ND ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM
Fluorene	0.47 ug/L	0.020	0.020		B15E414	05/28/15	06/01/15	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	ND ug/L	0.010	0.010		B15E414	05/28/15	06/01/15	EPA 8270-SIM
1-Methylnaphthalene	0.079 ug/L	0.040	0.040		B15E414	05/28/15	06/01/15	EPA 8270-SIM
2-Methylnaphthalene	ND ug/L	0.040	0.040		B15E414	05/28/15	06/01/15	EPA 8270-SIM
Naphthalene	ND ug/L	0.20	0.20	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Phenanthrene	0.11 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Pyrene	0.016 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Surrogate	Result	Expected						
2-Methylnaphthalene-d10	0.28 ug/L	0.229			B15E414	05/28/15	06/01/15	EPA 8270-SIM
Fluoranthene-d10	0.24 ug/L	0.229	106%	69-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM
22_32W : W15E199-09								
Acenaphthene	ND ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Acenaphthylene	ND ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Anthracene	0.047 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Benzo(a)anthracene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Benzo(a)pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Benzo(b)fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Benzo(g,h,i)perylene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Benzo(k)fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Chrysene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Dibenzo(a,h)anthracene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Fluorene	ND ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
1-Methylnaphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
2-Methylnaphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Naphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Phenanthrene	ND ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM
Surrogate	Result	Expected		•	,			
2-Methylnaphthalene-d10	0.25 ug/L	0.229			B15E414	05/28/15	06/01/15	EPA 8270-SIM
Fluoranthene-d10	0.24 ug/L	0.229	106%	69-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM

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Project: Portland Harbor Client: Director's Office Work Order: W15E199 Received: 05/28/15 15:15

Analyte	Result Units	MRL	MDL	Dil.	Batch	Prepared	Analyzed	Method	Qualifie
	INA					<u> </u>			<u> </u>
<u>semivolatile Organics - S</u>									
Polynuclear Aromatics & Phthal	ates by GCMS-SIM								
22_6W : W15E199-10									
Acenaphthene	ND ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Acenaphthylene	ND ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Anthracene	0.23 ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)anthracene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(a)pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(b)fluoranthene	0.010 ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(g,h,i)perylene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Benzo(k)fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Chrysene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Dibenzo(a,h)anthracene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluorene	ND ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
1-Methylnaphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
2-Methylnaphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Naphthalene	ND ug/L	0.040	0.040	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Phenanthrene	ND ug/L	0.020	0.020	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Pyrene	ND ug/L	0.010	0.010	1	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Surrogate	Result	Expected	l %Rec L	.imits(%	5)				
2-Methylnaphthalene-d10	0.24 ug/L	0.229	104% 6	0.4-153	B15E414	05/28/15	06/01/15	EPA 8270-SIM	
Fluoranthene-d10	0.24 ug/L	0.229	103% 6	9-149	B15E414	05/28/15	06/01/15	EPA 8270-SIM	

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Project: **Portland Harbor** Client: Director's Office Work Order: W15E199 Received: 05/28/15 15:15

Quality Control Report

General Chemistry - QC

Analyte	Result	Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Solids - Batch B1	5E448									
Duplicate (B15E448-DUP	21)		Source: W15	E202-02	2					
Total solids	83.2 % W	//W	0.01			83.0		0.2 (5)	05/29/15 :05/30/15	
			Fu	els - C	QC					
Analyte	Result	Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Diesel/Oil Hydrocarbon	ns by GC-FID - Batch B1	5E430								
Blank (B15E430-BLK2)										F7

Blank (B15E430-BLK2)

DIANK (DIDE43U-DLNZ)						_
Diesel	ND mg/Wipe	1.2			05/28/15 :06/03/15	
Lube oil	ND mg/Wipe	2.5			05/28/15 :06/03/15	
Surrogate						
2-Fluorobiphenyl	0.0831 mg/Wipe		0.100	83% (50-150)	05/28/15 :06/03/15	

Blank (B15F046-BLK1)							F
Diesel	ND mg/kg wet	21				06/03/15 :06/03/15	
Lube oil	ND mg/kg wet	42				06/03/15 :06/03/15	
Surrogate							
2-Fluorobiphenyl	14.0 mg/kg wet		16.7		84% (50-150)	06/03/15 :06/03/15	
LCS (B15F046-BS1)							F7
Diesel	190 mg/kg wet	25	200		95% (50-150)	06/03/15 :06/03/15	
Lube oil	111 mg/kg wet	50	200		55% (50-150)	06/03/15 :06/03/15	
Surrogate							
2-Fluorobiphenyl	22.0 mg/kg wet		20.0		110% (50-150)	06/03/15 :06/03/15	
Duplicate (B15F046-DUP1)		Source: W15E1	99-05				F7
Diesel	ND mg/kg dry	32		ND	(50)	06/03/15 :06/03/15	
Lube oil	310 mg/kg dry	58		201	43 (50)	06/03/15 :06/03/15	
Surrogate							
2-Fluorobiphenyl	23.8 mg/kg dry		23.4		102% (50-150)	06/03/15 :06/03/15	

Blank (B15F057-BLK2) F7 Diesel 0.12 ND mg/L 06/03/15 :06/09/15 Lube oil ND mg/L 0.062 06/03/15 :06/09/15 Surrogate

Reported: 06/17/15 12:54

Jennifer Shackelford





6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: **Portland Harbor** Client: Director's Office Work Order: **W15E199** Received: 05/28/15 15:15

Fuels - QC

Analyte	Result Units	MRL	Spike MDL Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Diesel/Oil Hydrocarbons by GC	C-FID - Batch B15F05	57						
Blank (B15F057-BLK2)								F7
Surrogate								
2-Fluorobiphenyl	0.0334 mg/L		0.0500		67% (50-150)		06/03/15 :06/09/15	
LCS (B15F057-BS2)								F7
Diesel	0.304 mg/L	0.031	0.500		61% (50-150)		06/03/15 :06/09/15	
Lube oil	0.403 mg/L	0.062	0.500		81% (50-150)		06/03/15 :06/09/15	
Surrogate								
2-Fluorobiphenyl	0.0324 mg/L		0.0500		65% (50-150)		06/03/15 :06/09/15	
LCS Dup (B15F057-BSD2)								F7
Diesel	0.303 mg/L	0.031	0.500		61% (50-150)	0.2 (200)	06/03/15 :06/09/15	
Lube oil	0.384 mg/L	0.062	0.500		77% (50-150)	5 (200)	06/03/15 :06/09/15	
Surrogate								
2-Fluorobiphenyl	0.0346 mg/L		0.0500		69% (50-150)		06/03/15 :06/09/15	
Hydrocarbon Scan by GC-FID	- Batch B15E430							
Blank (B15E430-BLK1)								
Gasoline	ND mg/Wipe	1					05/28/15 :05/28/15	
Lube oil	ND mg/Wipe	2					05/28/15 :05/28/15	
Diesel	ND mg/Wipe	2					05/28/15 :05/28/15	
Surrogate	0.0007							
2-Fluorobiphenyl	0.0867 mg/Wipe		0.100		87% (50-150)		05/28/15 :05/28/15	
Hydrocarbon Scan by GC-FID	- Batch B15E437							
Blank (B15E437-BLK1)								
Gasoline	ND mg/kg wet	17					05/29/15 :05/29/15	
Diesel	ND mg/kg wet	42					05/29/15 :05/29/15	
Lube oil	ND mg/kg wet	83					05/29/15 :05/29/15	
Surrogate								
2-Fluorobiphenyl	7.64 mg/kg wet		8.33		92% (50-150)		05/29/15 :05/29/15	
Duplicate (B15E437-DUP1)		Source: W15	E199-05					
Gasoline	ND mg/kg dry	27		ND			05/29/15 :05/29/15	
Diesel	ND mg/kg dry	66		ND			05/29/15 :05/29/15	
Lube oil	DET mg/kg dry	133		DET			05/29/15 :05/29/15	
Surrogate	40.0							
2-Fluorobiphenyl	13.0 mg/kg dry		13.3		98% (50-150)		05/29/15 :05/29/15	
Hydrocarbon Scan by GC-FID	- Batch B15F057							
Blank (B15F057-BLK1)								
Gasoline	ND mg/L	0.12					06/03/15 :06/04/15	
Diesel	ND mg/L	0.25					06/03/15 :06/04/15	

Reported: 06/17/15 12:54

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6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: Portland Harbor Client: Director's Office Work Order: W15E199 Received: 05/28/15 15:15

Fuels - QC

Analyte	Result	Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Hydrocarbon Scan by GC-l	FID - Batch B15F0	57								
Blank (B15F057-BLK1)										
Lube oil	ND mg	ı/L	0.25						06/03/15 :06/04/15	
Surrogate										
2-Fluorobiphenyl	0.0333 mg	J/L			0.0500		67% (50-150)		06/03/15 :06/04/15	
LCS (B15F057-BS1)										
Gasoline	DET mg	J/L	0.06		0.200		42% (50-150)		06/03/15 :06/04/15	
Diesel	DET mg	J/L	0.25		0.500		66% (50-150)		06/03/15 :06/04/15	
Lube oil	DET mg	J/L	0.25		0.500		66% (50-150)		06/03/15 :06/04/15	
Surrogate										
2-Fluorobiphenyl	0.0296 mg	J/L			0.0500		59% (50-150)		06/03/15 :06/04/15	
LCS Dup (B15F057-BSD1)										
Gasoline	DET mg	ı/L	0.05		0.200		29% (50-150)		06/03/15 :06/04/15	
Diesel	DET mg	J/L	0.25		0.500		66% (50-150)		06/03/15 :06/04/15	
Lube oil	DET mg	ı/L	0.25		0.500		61% (50-150)		06/03/15 :06/04/15	
Surrogate										
2-Fluorobiphenyl	0.0325 mg	J/L			0.0500		65% (50-150)		06/03/15 :06/04/15	
Hydrocarbon Scan by GC-I	FID - Batch B15F1	26								
Blank (B15F126-BLK1)										
Gasoline	ND mg	ı/L	0.12						06/08/15 :06/08/15	
Diesel	ND mg	J/L	0.25						06/08/15 :06/08/15	
Lube oil	ND mg	J/L	0.25						06/08/15 :06/08/15	FC
Surrogate										
2-Fluorobiphenyl	0.0290 mg	J/L			0.0500		58% (50-150)		06/08/15 :06/08/15	
LCS (B15F126-BS1)										
Diesel	DET mg	ı/L	0.25		0.500		66% (50-150)		06/08/15 :06/08/15	
Surrogate										
2-Fluorobiphenyl	0.0372 mg	_J /L			0.0500		74% (50-150)		06/08/15 :06/08/15	
LCS Dup (B15F126-BSD1)										
Diesel	DET mg	ı/L	0.25		0.500		58% (50-150)		06/08/15 :06/08/15	
Surrogate										
2-Fluorobiphenyl	0.0292 mc	1/L			0.0500		58% (50-150)		06/08/15 :06/08/15	

Reported: 06/17/15 12:54

Jennifer Shackelford





6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: Portland Harbor Client: Director's Office Work Order: W15E199 Received: 05/28/15 15:15

Semivolatile Organics - SIM - QC

Analyte	Result Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
Polynuclear Aromatics & Phtl	halates by GCMS-SIM - B	atch B15E414							
Blank (B15E414-BLK1)									
Acenaphthene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Acenaphthylene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Anthracene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Benzo(a)anthracene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(a)pyrene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(b)fluoranthene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(g,h,i)perylene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Benzo(k)fluoranthene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Chrysene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Fluoranthene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Fluorene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Indeno(1,2,3-cd)pyrene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
1-Methylnaphthalene	ND ug/L	0.040	0.040					05/28/15 :06/01/15	
2-Methylnaphthalene	ND ug/L	0.040	0.040					05/28/15 :06/01/15	
Naphthalene	ND ug/L	0.040	0.040					05/28/15 :06/01/15	
Phenanthrene	ND ug/L	0.020	0.020					05/28/15 :06/01/15	
Pyrene	ND ug/L	0.010	0.010					05/28/15 :06/01/15	
Butyl benzyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Di-n-butyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Diethyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Dimethyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Di-n-octyl phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Bis(2-ethylhexyl) phthalate	ND ug/L	1.0	0.50					05/28/15 :06/01/15	
Surrogate									
2-Methylnaphthalene-d10	0.23 ug/L			0.229		102% (60.4-153		05/28/15 :06/01/15	
Fluoranthene-d10	0.25 ug/L			0.229		108% (69-149)		05/28/15 :06/01/15	
LCS (B15E414-BS1)									
Acenaphthene	0.112 ug/L	0.020	0.020	0.114		98% (58.8-155)		05/28/15 :06/01/15	
Acenaphthylene	0.115 ug/L	0.020	0.020	0.114		100% (64-155)		05/28/15 :06/01/15	
Anthracene	0.117 ug/L	0.020	0.020	0.114		102% (76.2-129		05/28/15 :06/01/15	
Benzo(a)anthracene	0.119 ug/L	0.010	0.010	0.114		104% (72.9-138		05/28/15 :06/01/15	
Benzo(a)pyrene	0.122 ug/L	0.010	0.010	0.114		106% (75.5-137		05/28/15 :06/01/15	
Benzo(b)fluoranthene	0.117 ug/L	0.010	0.010	0.114		102% (59.9-160		05/28/15 :06/01/15	
Benzo(g,h,i)perylene	0.106 ug/L	0.010	0.010	0.114		93% (70.1-134)		05/28/15 :06/01/15	
Benzo(k)fluoranthene	0.119 ug/L	0.010	0.010	0.114		104% (61.1-157		05/28/15 :06/01/15	
Chrysene	0.123 ug/L	0.010	0.010	0.114		108% (76.7-146		05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	0.117 ug/L	0.010	0.010	0.114		102% (63.9-140		05/28/15 :06/01/15	
Fluoranthene	0.119 ug/L	0.010	0.010	0.114		104% (77.5-134		05/28/15 :06/01/15	
Fluorene	0.118 ug/L	0.020	0.020	0.114		103% (61.2-157		05/28/15 :06/01/15	

Reported: 06/17/15 12:54

Jennifer Shackelford





6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: **Portland Harbor** Client: Director's Office Work Order: W15E199 Received: 05/28/15 15:15

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MRL	MDL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifie
Polynuclear Aromatics & Phthala	tes by GCMS	S-SIM - Ba	tch B15E414							
LCS (B15E414-BS1)										
Indeno(1,2,3-cd)pyrene	0.112 ug/	L	0.010	0.010	0.114		98% (68.4-135)		05/28/15 :06/01/15	
1-Methylnaphthalene	0.131 ug/	L	0.040	0.040	0.114		114% (79.6-158		05/28/15 :06/01/15	
2-Methylnaphthalene	0.125 ug/	L	0.040	0.040	0.114		109% (76-161)		05/28/15 :06/01/15	
Naphthalene	0.117 ug/	L	0.040	0.040	0.114		103% (60.6-164		05/28/15 :06/01/15	
Phenanthrene	0.111 ug/	L	0.020	0.020	0.114		97% (77.4-140)		05/28/15 :06/01/15	
Pyrene	0.127 ug/	L	0.010	0.010	0.114		111% (81.1-141)		05/28/15 :06/01/15	
Surrogate										
2-Methylnaphthalene-d10	0.23 ug/	L			0.229		102% (60.4-153		05/28/15 :06/01/15	
Fluoranthene-d10	0.24 ug/	L			0.229		105% (69-149)		05/28/15 :06/01/15	
Matrix Spike (B15E414-MS1)			Source: W15	E194-05						
Acenaphthene	0.325 ug/	L	0.020	0.020	0.286	ND	114% <i>(58.8-155</i>		05/28/15 :06/01/15	
Acenaphthylene	0.319 ug/	L	0.020	0.020	0.286	ND	112% (64-155)		05/28/15 :06/01/15	
Anthracene	0.328 ug/	L	0.020	0.020	0.286	ND	115% (76.2-129		05/28/15 :06/01/15	
Benzo(a)anthracene	0.302 ug/	L	0.010	0.010	0.286	ND	106% (72.9-138		05/28/15 :06/01/15	
Benzo(a)pyrene	0.300 ug/	L	0.010	0.010	0.286	ND	105% <i>(75.5-137</i>		05/28/15 :06/01/15	
Benzo(b)fluoranthene	0.288 ug/	L	0.010	0.010	0.286	ND	101% <i>(59.9-160</i>		05/28/15 :06/01/15	
Benzo(g,h,i)perylene	0.259 ug/	L	0.010	0.010	0.286	ND	91% (70.1-134)		05/28/15 :06/01/15	
Benzo(k)fluoranthene	0.291 ug/	L	0.010	0.010	0.286	ND	102% (61.1-157		05/28/15 :06/01/15	
Chrysene	0.315 ug/	L	0.010	0.010	0.286	ND	110% <i>(76.7-146</i>		05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	0.282 ug/	L	0.010	0.010	0.286	ND	99% (63.9-140)		05/28/15 :06/01/15	
Fluoranthene	0.319 ug/	L	0.010	0.010	0.286	ND	112% (77.5-134		05/28/15 :06/01/15	
Fluorene	0.345 ug/	L	0.020	0.020	0.286	0.0251	112% (61.2-157		05/28/15 :06/01/15	
Indeno(1,2,3-cd)pyrene	0.274 ug/	L	0.010	0.010	0.286	ND	96% (68.4-135)		05/28/15 :06/01/15	
1-Methylnaphthalene	0.367 ug/	L	0.040	0.040	0.286	ND	129% (79.6-159		05/28/15 :06/01/15	
2-Methylnaphthalene	0.350 ug/	L	0.040	0.040	0.286	ND	123% (76-161)		05/28/15 :06/01/15	
Naphthalene	0.325 ug/	L	0.040	0.040	0.286	ND	114% <i>(60.6-164</i>		05/28/15 :06/01/15	
Phenanthrene	0.313 ug/	L	0.020	0.020	0.286	ND	109% (77.4-140		05/28/15 :06/01/15	
Pyrene	0.341 ug/	L	0.010	0.010	0.286	ND	119% <i>(81.1-141</i>		05/28/15 :06/01/15	
Surrogate										
2-Methylnaphthalene-d10	0.25 ug/				0.229		109% <i>(60.4-153</i>		05/28/15 :06/01/15	
Fluoranthene-d10	0.25 ug/	L			0.229		110% <i>(69-149)</i>		05/28/15 :06/01/15	
Matrix Spike Dup (B15E414-MSD1)			Source: W15	E194-05						
Acenaphthene	0.322 ug/	L	0.020	0.020	0.286	ND	113% <i>(58.8-155</i> 0.	7 (50)	05/28/15 :06/01/15	
Acenaphthylene	0.320 ug/	L	0.020	0.020	0.286	ND	112% <i>(64-155)</i> 0.	2 (50)	05/28/15 :06/01/15	
Anthracene	0.324 ug/	L	0.020	0.020	0.286	ND	113% (76.2-129 1	(50)	05/28/15 :06/01/15	
Benzo(a)anthracene	0.310 ug/	L	0.010	0.010	0.286	ND	108% (72.9-138 3	(50)	05/28/15 :06/01/15	
Benzo(a)pyrene	0.310 ug/	L	0.010	0.010	0.286	ND	108% (75.5-137 3	(50)	05/28/15 :06/01/15	
Benzo(b)fluoranthene	0.293 ug/	L	0.010	0.010	0.286	ND	103% (59.9-160 2	(50)	05/28/15 :06/01/15	
Benzo(g,h,i)perylene	0.271 ug/	L	0.010	0.010	0.286	ND	95% (70.1-134) 4	(50)	05/28/15 :06/01/15	
Benzo(k)fluoranthene	0.303 ug/	L	0.010	0.010	0.286	ND	106% (61.1-157 4	(50)	05/28/15 :06/01/15	

Reported: 06/17/15 12:54

Jennifer Shackelford





6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: **Portland Harbor** Client: Director's Office Work Order: **W15E199** Received: 05/28/15 15:15

Semivolatile Organics - SIM - QC

Spike

Source

%Rec

RPD

Prepared:

Analyte	Result	Units	MRL	MDL	Level	Result	(Limits)	(Limit)	Analyzed	Qualifier
Polynuclear Aromatics & Phthalate	s by GCMS	S-SIM - Ba	tch B15E414							
Matrix Spike Dup (B15E414-MSD1)			Source: W15	E194-05	j					
Chrysene	0.324 ug/	'L	0.010	0.010	0.286	ND	113% (76.7-146 3	(50)	05/28/15 :06/01/15	
Dibenzo(a,h)anthracene	0.297 ug/	L	0.010	0.010	0.286	ND	104% (63.9-140 5	(50)	05/28/15 :06/01/15	
Fluoranthene	0.317 ug/	L	0.010	0.010	0.286	ND	111% <i>(77.5-134)</i> 0	.7 (50)	05/28/15 :06/01/15	
Fluorene	0.351 ug/	L	0.020	0.020	0.286	0.0251	114% (61.2-157 2	(50)	05/28/15 :06/01/15	
Indeno(1,2,3-cd)pyrene	0.287 ug/	L	0.010	0.010	0.286	ND	101% <i>(68.4-135</i> 5	(50)	05/28/15 :06/01/15	
1-Methylnaphthalene	0.364 ug/	L	0.040	0.040	0.286	ND	127% (79.6-159 0	.9 (50)	05/28/15 :06/01/15	
2-Methylnaphthalene	0.350 ug/	L	0.040	0.040	0.286	ND	122% (76-161) 0	.2 (50)	05/28/15 :06/01/15	
Naphthalene	0.320 ug/	L	0.040	0.040	0.286	ND	112% (60.6-164 2	(50)	05/28/15 :06/01/15	
Phenanthrene	0.315 ug/	L	0.020	0.020	0.286	ND	110% (77.4-140 0	.9 (50)	05/28/15 :06/01/15	
Pyrene	0.337 ug/	L	0.010	0.010	0.286	ND	118% (81.1-141 1	(50)	05/28/15 :06/01/15	
Surrogate										
2-Methylnaphthalene-d10	0.25 ug/	L			0.229		108% (60.4-153		05/28/15 :06/01/15	
Fluoranthene-d10	0.25 ug/	'L			0.229		108% <i>(69-149)</i>		05/28/15 :06/01/15	

Qualifiers

	Qualifie	rs	
F0	Analyte was detected in the Method Blank at a concentration grea reporting level. Sample result may be a high estimate.	ter than one	half of the reporting level, but less than the
F0a	Fuel pattern most closely resembles transformer oil.		
F0b	Results resembles most closely non-PCB transformer oil.		
F2	Result for heavy oil is primarily due to overlap from diesel-range h	ydrocarbons	
F4	Result for gasoline is primarily overlap from diesel-range hydrocar	bons.	
F6	Surrogate recovery could not be determined due to the high conce	entration of h	ydrocarbons in the sample.
F7	This sample underwent silica gel clean-up.		
SU5	Surrogate recovery could not be determined due to required dilution	on of the san	nple extract.
	Definitio	ns	
DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference

Reported: 06/17/15 12:54

Jennifer Shackelford

This analyte is not certified under NELAP

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Water Pollution Control Laboratory 6543 N. Burlington Ave. Portland, Oregon 97203-4552 Sample Custodian: (503) 823-5696 General Lab: (503) 823-5681



Date: 5/28/15

Work Order #: W15E199

Collected By: MJS, WCR, ELH, PHA

Client Name: Director's Office
Project Name: Portland Harbor

									Reque	este	d Ana	lyses					
	Special Instructions:						E										
	Basin 22 Petroleum S	heen Investi	gation	ï											hos/cm)		f-Time Request:
ımber	¹ Run NWTPH-Dx and	NWTPH-Gx	if detected	I		·HCID,	PAH (low-Level)								Conductivity (umhos/cm)		(10 business days) usiness days)
Lab Number	Location ID	Sample Date	Sample Time	<u>G</u> rab or <u>C</u> omp	Sample Matrix	NWTPH-HCID ¹	PAH (lo								Conduc Meter: _	# of Containers	Remarks
01	22_24W	5/28/2015	1013	G	Water	•	•								254	2 A(33059 ABQ059 Surface Sheen Water
2	22_25Wipe	5/28/2015	1018	G	Wipe	•										1 AG	හිර5ි ABQ059 Wipe above 16" inlet දී
3	22_26Wipe	5/28/2015	1021	G 4	Wipe	•										1 AG	.8059 ABQ 059 Wipe below 6" inlet
4	22_27W	5/28/2015	1043	G .	Water	•	•						3		103	2	AAP794 Dry Flow from 12" Lat
5	22_28	5/28/2015	1050	C	Sed	•										1	AAP794 Inline Sediment DS
6	22_29W	5/28/2015	1056	G	Water	•	•								184	2	AAP794 Dry Flow from US
7	22_30Wipe	5/28/2015	1116	G	Wipe	•										1	ANV453 Wipe under east Lat §
8	22_31Wipe	5/28/2015	1119	G	Wipe	•										1	ANV543 Wipe from east shelf
9	22_32W	5/28/2015	1148	G	Water	•	•								173	2	AAP792 N Dry Flow from S Lat
/	- 6W	5/28/2015	1209	G	Water	•	•								194	2	AAP791 Dry Flow
rage lo	linguished By:	11.00	Dates	18/14	Received By Signature:		_	1 _	Date:		inquished ature:	By:		Date:	Rece Signat	ived By: ure:	Date:
0 01 10	ted Name: Matt Sulliva	n	time:	18/19 515	Printed Name:	m hola	1	Jennos -	5.28-15 Time: (5:15		ed Name:			Time:	Printe	l Name:	Time:
P	Portland Harbor - Bas						-									Pa	ge \ of _ _

Water Pollution Control Laboratory 6543 N. Burlington Ave. Portland, Oregon 97203-4552 Sample Custodian: (503) 823-5696 General Lab: (503) 823-5681



Date: 5/28/15

Work Order #: WISE199

Collected By: MJ5, WCR, ECH, PHA

Client Name:	Director's Office	
Project Name:	Portland Harbor	

Requested Analyses Special Instructions: Turn-Around-Time Request: Conductivity (umhos/cm) Basin 22 Petroleum Sheen Investigation Combo Standard (10 business days) PAHs (low-Level) Lab Number NWTPH-HCID1 Run NWTPH-Dx and NWTPH-Gx if detected Rush (5 business days) Other: Sample Sample Grab or Sample # of Location ID Date Time Comp Matrix Containers Remarks AAP791 C 22_34_33 Sed . E 60.3 5/28/2015 1216 Inline Sediment US 10000 Cig AAM078 12 Sed • 22_36 34 5/28/2015 Inline Sediment US 1408 **AAM078** Wipe 22_86Wipe 1412 5/28/2015 G Wipe from MH Collar 35Wipe Page 17 of 18 Received By: Relinquished By: Received By: Signature: Signature: Date: Date: Printed Name: Printed Name: Time: 15:15 Portland Harbor - Basin 22 Petroleum Sheen COC #2 (5-28-15)

: E	50	## ## ## ## ##	# # # # # # # # # # # # # # # # # # #				Coo	ler F	Recei	pt Fo	rm	2 6	\$6 \$6				#2 20	×
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1	Are samples appropriately preserved? Do VOA vials have Headspace?										- 10 10	D 18	1 7	_				
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Pres. #	Pres. # Preservative LIMS ID							Sta	andaro	Pres	erva	tion A	Amounts		3		5 0	
1	HN	HNO ₃ (1:1) to pH <2						4 900					mL; 4-5 d	rops/5	0mL c	entri	fuge	tube
2													mL ; 1.6m					
3							1.0	0mL/50	00mL;	2.0n	L/100	0mL	****	Si		**	\$0	
4								Fo	r TOC	2-5 c	Irops	/250m	ıL	2			25	
5	Nac	OH (pellets) to pH >1	2	· *	* SE S		4-1	10 pelle	ets/50	0mL	8-20	pellets/10	00mL				100000000000000000000000000000000000000
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Investigation Day Three June 3, 2015



55 SW Yamhill Street, Suite 400 Portland, OR 97204 P: 503.239.8799 F: 503.239.8940 info@gsiwatersolutions.com www.gsiwatersolutions.com

Laboratory Data QA/QC Review Petroleum Sheen Investigation Outfall Basin 22

To: File

From: Andrew Davidson, GSI

Date: June 28, 2015

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated during a source control investigation sampling event conducted by the City of Portland (City). Six composite inline solids samples were collected in Outfall Basin 22 on June 3, 2015 and submitted for analyses.

The laboratory analyses for these source control program samples were completed by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and included the following analyses:

BES WPCL

- o Total Solids SM 2540 G (Inline solids samples only)
- o Hydrocarbon Analysis NWTPH-HCID (NWTPH-Dx, Gx if detected)

The WPCL summary report for all analyses associated with this sampling event is attached for review.

The following QA/QC review of the analytical data is based on the available documentation provided by WPCL. The QA/QC review consisted of reviewing the following elements from the laboratory report, if applicable and available:

- Chain-of-custody for completeness and continuous custody
- Analysis conducted within holding times
- Chemicals of interest detected in method blanks and/or field decontamination blanks
- Internal standard recoveries within laboratory control limits
- Surrogate recoveries within laboratory control limits

- Matrix spike/matrix spike duplicate (MS/MSD) sample results within laboratory control limits
- Laboratory control/duplicate laboratory control (LC/DLC) sample recoveries within laboratory control limits
- Relative percent differences (RPDs) for laboratory duplicate samples within laboratory control limits.

The results of the QA/QC review of the subcontracted laboratory reports are presented below.

Chain-of-Custody

The chain-of-custody forms showed continuous custody of the samples. The chain-of-custody procedures appear to have been adequate indicating that sample integrity was maintained throughout the sample collection and delivery process.

Analysis Holding Times

The samples were extracted and analyzed within the recommended method-specific holding times.

Method Blanks

Method blanks were processed during the hydrocarbon scan analysis (NWTPH-HCID), the analysis of diesel/oil hydrocarbons (NWTPH-Dx), and the analysis of gasoline (NWTPH-Gx). No analytes were detected in any of the method blank samples.

Surrogate Recoveries

Surrogate recoveries were processed during the laboratory analyses of hydrocarbons (NWTPH-HCID, NWTPH-Dx, and NWTPH-Gx). Surrogate recoveries were within control limits for all analyses.

Laboratory Control Samples/Duplicate Laboratory Control Samples

LCS samples were processed during the NWTPH-Dx and NWTPH-Gx analyses. All LCS recoveries were within laboratory control limits.

Duplicate Samples

Duplicate samples were processed during the analyses of total solids, NWTPH-HCID, NWTPH-Dx, and NWTPH-Gx for inline solids samples. All RPDs were within acceptance criteria with one exception:

 The duplicate sample collected from W15F041-02 and analyzed by NWTPH-Gx had an RPD above acceptance criteria. WPCL reports that the results indicate non-homogenous sample matrix and the sample result should be considered an estimate. Accordingly, the result for gasoline in sample W15F041-02 is flagged as an estimate "J" due to non-homogenous matrix "NM".

Additional Information

WPCL reports the following additional information regarding inline solids samples:

- Diesel results for samples W15F041-01, W15F041-02, W15F041-03, and W15F041-04 during the NWTPH-Dx analysis were positively biased by overlap from large Motor Oil peaks. Accordingly the data are flagged as estimates "J" due to matrix interference "MI".
- All samples analyzed by NWTPH-Dx underwent silica gel clean-up.
- WPCL reports that detections quantified as Diesel and Lube Oil in sample W15F041-04 actually appear to be a single petroleum product that is heavier than Diesel #2 and lighter than the reference lube oil. The values are qualified as estimates "J" due to inadequate matching with the reference compounds "RC".
- WPCL reports that the detected components in sample W15F041-06 does not resemble a fuel pattern but the quantity exceeds the reporting threshold.
- WPCL reports that gasoline detections in samples W15F041-01 and W15F041-02 are primarily due to overlap from diesel-range hydrocarbons. Accordingly, gasoline results for these two samples are qualified as estimates "J" due to matrix interference "MI".
- Sample aliquots for samples W15F041-01 and W15F041-02 were sub-sampled from a jar during the NWTPH-Gx analysis. The sub-sampled aliquot was not preserved with methanol within 48 hours of sampling. Sample results may be biased low. Associated results are flagged as estimates "J" to reflect inadequate preservation times "HT".



6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



June 22, 2015 Linda Scheffler

Director's Office

Work Order Project
W15F041 Portland Harbor

Received 06/03/15 14:57

Enclosed are the results of analysis for the above work order. If you have questions concerning this report, please contact your project coordinator Peter Abrams at 503-823-5533.

Jennifer Shackelford

Laboratory Coordinator QA/QC

Jennifer Shackelford







6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

LABORATORY ANALYSIS REPORT

Project: Portland Harbor

Work Order: **W15F041**Received: 6/3/15 14:57
Submitted By: Field Operations

Client: Director's Office Project Mgr: Linda Scheffler

			Sample Collection Date					
Sample	Laboratory ID	Matrix	Type	Start	End	Qualifier		
22_36	W15F041-01	Sediment	Composite	06/03/15 10:14	06/03/15 10:14			
22_37	W15F041-02	Sediment	Composite	06/03/15 10:20	06/03/15 10:20			
22_38	W15F041-03	Sediment	Composite	06/03/15 10:58	06/03/15 10:58			
22_39	W15F041-04	Sediment	Composite	06/03/15 11:33	06/03/15 11:33			
22_40	W15F041-05	Sediment	Composite	06/03/15 12:30	06/03/15 12:30			
22_41	W15F041-06	Sediment	Composite	06/03/15 12:46	06/03/15 12:46			

							- 1
Analyte	Result Units	MRL	Dil. Batch	Prepared	Analyzed	Method	Qualifier
General Chemistry							
Total Solids							
22_36 : W15F041-01 Total solids	76.5 % W/W	0.01	B15F07	9 06/04/15	06/05/15	SM 2540G	
22_37 : W15F041-02 Total solids	72.2 % W/W	0.01	B15F07	9 06/04/15	06/05/15	SM 2540G	
22_38 : W15F041-03 Total solids	82.4 % W/W	0.01	B15F07	9 06/04/15	06/05/15	SM 2540G	
22_39 : W15F041-04 Total solids	58.3 % W/W	0.01	B15F07	9 06/04/15	06/05/15	SM 2540G	
22_40 : W15F041-05 Total solids	62.9 % W/W	0.01	B15F07	9 06/04/15	06/05/15	SM 2540G	
22_41 : W15F041-06 Total solids	80.1 % W/W	0.01	B15F07	9 06/04/15	06/05/15	SM 2540G	

Reported: 06/22/15 08:22

Jennifer Shackelford

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.





6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: Portland Harbor Client: Director's Office Work Order: W15F041 Received: 06/03/15 14:57

Analyte	Result Units	MRL		Dil.	Batch	Prepared	Analyzed	Method	Qualifier
uels									
Diesel/Oil Hydrocarbons by GC-Fl	ID								
22_36 : W15F041-01									F7
Diesel	2100 mg/kg dry	140		5	B15F213	06/11/15	06/16/15	NWTPH-Dx	F
Lube oil	4800 mg/kg dry	270		5	B15F213	06/11/15	06/16/15	NWTPH-Dx	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	20.6 mg/kg dry	21.9	94%	50-150	B15F213	06/11/15	06/16/15	NWTPH-Dx	
22_37 : W15F041-02									F7
Diesel	3100 mg/kg dry	140		5	B15F213	06/11/15	06/16/15	NWTPH-Dx	F
Lube oil	8300 mg/kg dry	280		5	B15F213	06/11/15	06/16/15	NWTPH-Dx	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	22.0 mg/kg dry	22.5	98%	50-150	B15F213	06/11/15	06/16/15	NWTPH-Dx	
22_38 : W15F041-03									F7
Diesel	120 mg/kg dry	51		2	B15F213	06/11/15	06/16/15	NWTPH-Dx	 F(
Lube oil	770 mg/kg dry	100		2	B15F213	06/11/15	06/16/15	NWTPH-Dx	
Surrogate	Result	Expected	%Rec			00/11/10	00, 10, 10		
2-Fluorobiphenyl	19.7 mg/kg dry	20.2		•	B15F213	06/11/15	06/16/15	NWTPH-Dx	
22 39 : W15F041-04									F
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	30.4 mg/kg dry	31.1		-	B15F213	06/11/15	06/16/15	NWTPH-Dx	
22_39 : W15F041-04RE1									F7
-	27000	700		20	D45E040	00/44/45	00/40/45	NIM/TOLL D.	
Diesel	37000 mg/kg dry	780		20	B15F213	06/11/15	06/16/15	NWTPH-Dx	F0, F8
22_39 : W15F041-04RE4									F7
Lube oil	86000 mg/kg dry	3100		40	B15F213	06/11/15	06/17/15	NWTPH-Dx	
22_40 : W15F041-05									F7
Diesel	ND mg/kg dry	33		1	B15F213	06/11/15	06/16/15	NWTPH-Dx	
Lube oil	360 mg/kg dry	65		1	B15F213	06/11/15	06/16/15	NWTPH-Dx	
Surrogate	Result	Expected	%Rec	•		00/11/13	00/10/13	INVITITEDA	
2-Fluorobiphenyl	23.6 mg/kg dry	26.1			B15F213	06/11/15	06/16/15	NWTPH-Dx	
22 44 : 10/455044 06									۲.
22_41 : W15F041-06	••	00		4	D45E040	00/44/45	00/40/45	NIMTOLLO	F7
Diesel	30 mg/kg dry	28		1	B15F213	06/11/15	06/16/15	NWTPH-Dx	F:
Lube oil	330 mg/kg dry Result	56	0/ Dag	1	B15F213	06/11/15	06/16/15	NWTPH-Dx	
Surrogate 2-Fluorobiphenyl	20.0 mg/kg dry	Expected 22.3		50-150		06/11/15	06/16/15	NWTPH-Dx	
Hydrocarbon Scan by GC-FID		22.0	00,0		2.0.2.0	00.110	00, 10, 10		
•									
22_36 : W15F041-01									
Gasoline	DET mg/kg dry	47		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	F4
Diesel	DET mg/kg dry	117		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	
Lube oil	DET mg/kg dry	235		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	
Surrogate	Result	Expected		-	-	00/04/17	00/2:::=	AUL/TOLL::0:5	
2-Fluorobiphenyl	11.0 mg/kg dry	11.7	94%	50-150	B15F078	06/04/15	06/04/15	NWTPH-HCID	

Reported: 06/22/15 08:22

Jennifer Shackelford





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Project: Portland Harbor Client: Director's Office Work Order: W15F041 Received: 06/03/15 14:57

Analyte	Result Units	MRL		Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Fuels									
Hydrocarbon Scan by GC-FID									
22_37 : W15F041-02									
Gasoline	DET mg/kg dry	50		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	F4
Diesel	DET mg/kg dry	124		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	
Lube oil	DET mg/kg dry	248		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	12.0 mg/kg dry	12.4	97%	50-150	B15F078	06/04/15	06/04/15	NWTPH-HCID	
22_38 : W15F041-03									
Gasoline	ND mg/kg dry	41		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	
Diesel	DET mg/kg dry	104		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	F1
Lube oil	DET mg/kg dry	207		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	10.2 mg/kg dry	10.4	98%	50-150	B15F078	06/04/15	06/04/15	NWTPH-HCID	
22_39 : W15F041-04									
Gasoline	ND mg/kg dry	62		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	
Diesel	DET mg/kg dry	154		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	F1
Lube oil	DET mg/kg dry	308		1	B15F078	06/04/15	06/04/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	14.5 mg/kg dry	15.4	94%	50-150	B15F078	06/04/15	06/04/15	NWTPH-HCID	
22_40 : W15F041-05RE1									
Gasoline	ND mg/kg dry	57		1	B15F078	06/04/15	06/05/15	NWTPH-HCID	
Diesel	DET mg/kg dry	143		1	B15F078	06/04/15	06/05/15	NWTPH-HCID	F1
Lube oil	DET mg/kg dry	285		1	B15F078	06/04/15	06/05/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	13.3 mg/kg dry	14.3	93%	50-150	B15F078	06/04/15	06/05/15	NWTPH-HCID	
22_41 : W15F041-06RE1									
Gasoline	ND mg/kg dry	44		1	B15F078	06/04/15	06/05/15	NWTPH-HCID	
Diesel	ND mg/kg dry	109		1	B15F078	06/04/15	06/05/15	NWTPH-HCID	
Lube oil	DET mg/kg dry	219		1	B15F078	06/04/15	06/05/15	NWTPH-HCID	
Surrogate	Result	Expected	%Rec	Limits(%	6)				
2-Fluorobiphenyl	10.4 mg/kg dry	10.9	96%	50-150	B15F078	06/04/15	06/05/15	NWTPH-HCID	

Reported: 06/22/15 08:22

Jennifer Shackelford





6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: Portland Harbor Client: Director's Office Work Order: W15F041 Received: 06/03/15 14:57

						_			
Analyte	Result Units	MRL		Dil.	Batch	Prepared	Analyzed	Method	Qualifier
Volatile Organics									
NWTPH-Gx by GCMS									
22_36 : W15F041-01									F12
Gasoline	156 mg/kg dry	8.01		50	B15F176	06/09/15 16:15	06/10/15	NWTPH-Gx	F4
Surrogate	Result	Expected	%Rec	Limits(%	6)				
Dibromofluoromethane	0.0273 mg/L	0.0250	109%	50-150	B15F176	06/09/15 16:15	06/10/15	NWTPH-Gx	
Toluene-d8	0.0314 mg/L	0.0250	125%	50-150	B15F176	06/09/15 16:15	06/10/15	NWTPH-Gx	
22_37 : W15F041-02									F12
Gasoline	140 mg/kg dry	8.43		50	B15F176	06/09/15 16:15	06/10/15	NWTPH-Gx	F4, M1
Surrogate	Result	Expected	%Rec	Limits(%	6)				
Dibromofluoromethane	0.0275 mg/L	0.0250	110%	50-150	B15F176	06/09/15 16:15	06/10/15	NWTPH-Gx	
Toluene-d8	0.0324 mg/L	0.0250	130%	50-150	B15F176	06/09/15 16:15	06/10/15	NWTPH-Gx	

Reported: 06/22/15 08:22

Jennifer Shackelford

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6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656 ORELAP Certification ID 4023

Project: **Portland Harbor** Client: Director's Office Work Order: **W15F041** Received: 06/03/15 14:57

Quality Control Report

General Chemistry - QC

Analyte	Result	Units	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Solids - Batch B15F079									
Duplicate (B15F079-DUP1)			Source: W15F041	I - 01					
Total solids	77.3 %	W/W	0.01		76.5		1 (5)	06/04/15 :06/05/15	

Fuels - QC

Analyte	Result Units	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Diesel/Oil Hydrocarbons by GC	-FID - Batch B15F21	3						
Blank (B15F213-BLK1)								F7
Diesel	ND mg/kg wet	21					06/11/15 :06/16/15	
Lube oil	ND mg/kg wet	42					06/11/15 :06/16/15	
Surrogate								
2-Fluorobiphenyl	13.5 mg/kg wet		16.7		81% (50-150)		06/11/15 :06/16/15	
LCS (B15F213-BS1)								F7
Diesel	56.6 mg/kg wet	25	50.0		113% (50-150)		06/11/15 :06/16/15	
Lube oil	48.3 mg/kg wet	25	50.0		97% (50-150)		06/11/15 :06/16/15	
Surrogate					, ,			
2-Fluorobiphenyl	18.0 mg/kg wet		20.0		90% (50-150)		06/11/15 :06/16/15	
Duplicate (B15F213-DUP1)		Source: W15F04	1-06					F7
Diesel	ND mg/kg dry	25		30.1		(50)	06/11/15 :06/16/15	
Lube oil	265 mg/kg dry	51		332		23 (50)	06/11/15 :06/16/15	
Surrogate						. ,		
2-Fluorobiphenyl	19.0 mg/kg dry		20.2		94% (50-150)		06/11/15 :06/16/15	
Duplicate (B15F213-DUP2)		Source: W15F10	8-01					F7
Diesel	485 mg/kg dry	30		667		32 (50)	06/11/15 :06/16/15	F3
Lube oil	193 mg/kg dry	59		239		21 (50)	06/11/15 :06/16/15	
Surrogate								
2-Fluorobiphenyl	21.7 mg/kg dry		23.6		92% (50-150)		06/11/15 :06/16/15	
Hydrocarbon Scan by GC-FID	- Batch B15F078							
Blank (B15F078-BLK1)								
Gasoline	ND mg/kg wet	33					06/04/15 :06/04/15	
Diesel	ND mg/kg wet	83					06/04/15 :06/04/15	
Lube oil	ND mg/kg wet	167					06/04/15 :06/04/15	
Surrogate								
2-Fluorobiphenyl	6.68 mg/kg wet		8.33		80% (50-150)		06/04/15 :06/04/15	

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Project: Portland Harbor Client: Director's Office Work Order: W15F041 Received: 06/03/15 14:57

Fuels - QC

Analyte	Result Units	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Hydrocarbon Scan by GC-FID -	Batch B15F078							
Duplicate (B15F078-DUP1)		Source: W15F04	11-03					
Gasoline	ND mg/kg dry	42		ND			06/04/15 :06/04/15	
Diesel	DET mg/kg dry	106		DET			06/04/15 :06/04/15	F1
Lube oil	DET mg/kg dry	212		DET			06/04/15 :06/04/15	
Surrogate								
2-Fluorobiphenyl	10.2 mg/kg dry		10.6		96% (50-150)		06/04/15 :06/04/15	

Volatile Organics - QC

Analyte	Result Units	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
NWTPH-Gx by GCMS - Batch	B15F176							
Blank (B15F176-BLK1)								
Gasoline	ND mg/kg wet	4.17					06/09/15 :06/10/15	
Surrogate								
Dibromofluoromethane	0.0285 mg/L		0.0250		114% (50-150)		06/09/15 :06/10/15	
Toluene-d8	0.0277 mg/L		0.0250		111% (50-150)		06/09/15 :06/10/15	
LCS (B15F176-BS2)								
Gasoline	29.7 mg/kg wet	5.00	25.0		119% (70-130)		06/09/15 :06/10/15	
Surrogate								
Dibromofluoromethane	0.0254 mg/L		0.0250		102% (50-150)		06/09/15 :06/10/15	
Toluene-d8	0.0250 mg/L		0.0250		100% (50-150)		06/09/15 :06/10/15	
Duplicate (B15F176-DUP1)		Source: W15F04	41-02					
Gasoline	102 mg/kg dry	8.33		140	3	1 (20)	06/09/15 :06/10/15	F4, M1
Surrogate								
Dibromofluoromethane	0.0281 mg/L		0.0250		112% (50-150)		06/09/15 :06/10/15	
Toluene-d8	0.0302 mg/L		0.0250		121% (50-150)		06/09/15 :06/10/15	

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Project: **Portland Harbor** Client: Director's Office Work Order: W15F041 Received: 06/03/15 14:57

Qualifiers

F0	Result for Diesel range is positively biased by overlap from large Motor Oil peak(s).
F1	Result for diesel-range hydrocarbons is primarily due to overlap from the heavy oil range.
F12	Sample aliquot was sub-sampled from a soil jar. The sub-sampled aliquot was not preserved with methanol within 48 hours of sampling. Sample results may be biased low.
F3	Result for diesel-range hydrocarbons is primarily due to overlap from gasoline range.
F4	Result for gasoline is primarily overlap from diesel-range hydrocarbons.
F5	Detected components do not resemble a fuel pattern but the quantity exceeds the reporting threshold.
F7	This sample underwent silica gel clean-up.
F8	Hydrocarbons quantified as Diesel and Lube Oil appear to be a single petroleum product that is heavier than Diesel #2 and lighter than the reference Lube Oil.
M1	Matrix duplicate precision measurement indicates non-homogeneous sample matrix. Sample result should be considered an estimate.
	Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference
*	This analyte is not certified under NELAP		

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Water Pollution Control Laboratory 6543 N. Burlington Ave: Portland, Oregon 97203-4552 Sample Custodian: (503) 823-5696 General Lab: (503) 823-5681



Date: 6/3/15

Work Order #: W15F04/

Collected By: MJS, PHA, ELH, WCR

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Project Name:	Portland Harbor	Ø.		3 0		

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3	HCI (1:1) to pl			1.0mL/500mL; 2.0mL/1000mL For TOC: 2-5 drops/250mL									
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5	NaOH (pellets) to pH >12		4-10 pellets/50	00mL; 8-20	pellets/1000mL	,						
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